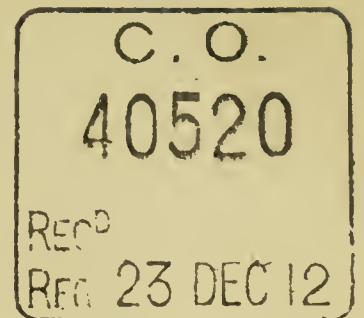


15 Jan. 1913

Nyasaland Protectorate.



ANNUAL REPORT

ON



THE MEDICAL DEPARTMENT


FOR

THE YEAR ENDED 31ST MARCH, 1912.

Published by command of His Excellency the Governor.



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Nyasaland Protectorate.



ANNUAL MEDICAL REPORT for the Year ended 31st March, 1912.

1. ADMINISTRATIVE: STAFF.

The Medical Staff comprises :—

The Principal Medical Officer : H. HEARSEY.

Eleven Medical Officers : A. H. BARCLAY, J. E. S. OLD, J. B. DAVEY, H. S. STANNUS, J. O. SHIRCORE, A. G. ELDERED, G. M. SANDERSON, D. DREW, R. DRUMMOND, R. BURY, and J. G. MORGAN.

The Nursing Staff is as follows :—

Matron : R. PATERSON.

Four Nursing Sisters. A. M. TADMAN, A. A. PALLOT, H. A. LAWRENCE, and M. BYERLEY.

Subordinate Staff. This consists of four First Class Sub-Assistant Surgeons, seconded from the Indian Medical Service, subordinate grade. Two of these, S. A. S. GURMUKH SINGH and S. A. S. VARYAM SINGH are in Civil employment ; and two, S. A. S. BIR SINGH and S. A. S. SULEIMAN GULAB are attached to the Troops.

PRINCIPAL APPOINTMENTS AND CHANGES DURING THE YEAR :—

Medical Staff.

Dr. A. H. Barclay who was acting as P. M. O. has proceeded on leave, on the return from leave of the Principal Medical Officer.

Dr. J. E. S. Old has been on leave, and on his return assumed medical charge of the Lower Shire and Ruw districts.

Dr. J. B. Davey has been seconded for service with the Scientific Commission of the Royal Society, and Dr. Conran has been appointed, temporarily, to fill this vacancy on the staff.

Dr. H. S. Stannus, on return from leave, has resumed medical charge of Zomba district.

Dr. J. O. Shircore who has been in medical charge of the Lower Shire and Ruw districts, has, on the return of Dr. J. E. S. Old, assumed the duties of senior Medical Officer in charge of Sleeping Sickness Investigations.

Dr. A. G. Eldred, recently appointed to the staff on transfer from the West Coast, has assumed medical charge of the Blantyre district.

Dr. G. M. Sanderson, who has been in charge of Sleeping Sickness Investigations in the Dowa sub-district, has proceeded on leave.

Dr. D. Drew, prior to assuming medical charge of the North Nyasa district, has been placed on duty in connection with Sleeping Sickness Investigations in the South Nyasa district.

Dr. R. Drummond, lately in medical charge of Zomba district has proceeded on Sleeping Sickness duty.

Dr. R. Bury is in medical charge of the South Nyasa district.

Dr. J. G. Morgan, recently appointed to the staff, has been temporarily placed on Sleeping Sickness duty in the Dowa sub-district, prior to assuming medical charge of the Marimba district.

Nursing Staff.

Miss H. LAWRENCE has been invalided home.

Miss M. BYERLEY has resigned her appointment.

Subordinate Staff.

S. A. S. Gurmukh Singh remains in charge of the Civil Dispensary, Zomba.

S. A. S. Varyam Singh is attached to the Sleeping Sickness Camp at Ngani.

S. A. S. Suleiman Gulab is attached to the Troops at headquarters, Zomba.

S. A. S. Bir Singh is attached to the Troops at Fort Mangoche.

TABLE I.

Medical Staff.*Principal Medical Officer* : H. HEARSEY.*Medical Officers.*

A. H. BARCLAY.
 J. E. S. OLD.
 1 J. B. DAVEY.
 H. S. STANNUS.
 J. O. SHIRCORE.
 A. G. ELDRED.

G. M. SANDERSON.
 D. DREW.
 R. DRUMMOND.
 R. BURY.
 J. G. MORGAN.
 2 P. C. CONRAN.

Nursing Staff.*Matron* : R. PATERSON.*Nursing Sisters.*

A. M. TADMAN.
 A. A. PALLOT.

3 M. BYERLEY.
 4 H. LAWRENCE.

Subordinate Staff.*Sub-Assistant Surgeons* :

GURMUKH SINGH.
 VARYAM SINGH.

BIR SINGH.
 SULEIMAN GULAB.

1. Seconded for service with the Scientific Commission of the Royal Society.
2. Appointed temporarily in place of Dr. Davey.
3. Resigned.
4. Invalided.

TABLE II.

Financial Return, 1911-12.

Expenditure.

	£	s.	d.
Personal Emoluments, European Staff	5,887	18	8
" " Subordinate, ..	630	2	2
" " Medical Officer, Chinde ..	50	0	0
Upkeep of Hospitals and Dispensaries	116	13	4
Medical Stores and Books	569	3	8
Travelling	328	1	6
Passages	937	13	6
Calf Lymph	86	10	6
Lunatic Asylum	52	6	11
Small-pox	20	9	11
Sleeping Sickness	1,182	13	3
Miscellaneous	154	5	6
	£ 10,015, 18 11		

Revenue.

Hospital Receipts	£	77	9	0
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TABLE III.

Return of Statistics of Population for the Year 1911-12.

	Europeans and Whites	Africans	Asiatics
Number of inhabitants 1911-12	773	999,423	463
Number of Births 1911-12	24	no record	no record
Number of Deaths 1911-12	7	no record	8
Number of immigrants 1911-12	no record	no record	no record
Number of Emigrants 1911-12			
Number of inhabitants 1910-11	766	969,183	481
Increase	7	30,240	..
Decrease ... ..	...	...	18

II. PUBLIC HEALTH.

(a). General Remarks.

- (1). General Diseases. There were none of any importance recorded during the year.
- (2). Communicable Diseases.

MOSQUITO OR INSECT-BORNE.

Malaria. The seasonal incidence of malaria has corresponded with that of previous years, the largest proportion of cases having occurred during and shortly after the wet season. It should be remembered, however, that not a few Europeans get infected whilst travelling, and this circumstance needs to be borne in mind when considering the seasonal distribution of cases among this community. There were 808 cases of malaria treated in the past year, as compared with 786 in the year preceding.

Blackwater Fever. Five cases of blackwater fever, as against three in the previous year, have come under the care of Medical Officers, and this number includes one Asiatic. Two of these cases had a fatal termination, namely, one European and the Asiatic referred to. It is noteworthy that notwithstanding the appreciable increase in the European population within recent years, the number of cases of blackwater fever has perceptibly diminished. This no doubt is mainly to be attributed to the greater attention which is now devoted to personal prophylaxis in regard to malaria.

Trypanosomiasis. Sixty-three cases of Sleeping Sickness have been recorded in the Protectorate up to the present, and during the year under review twenty-seven cases have been diagnosed, twenty-four of which were found in the Proclaimed Area of the Dowa sub-district.

A Segregation Camp was built on Ngani Hill by Dr. Sanderson, as well as a Medical Officer's house, a Laboratory, Dispensary, and other necessary buildings for the accommodation of the native staff. To this Camp, the patients who had hitherto been in charge of Dr. Murray at the Mvera Mission, were removed in the month of May.

The measures which were instituted in the year 1910-11 remained in operation, and every village in the Proclaimed Area was visited by Dr. Sanderson, all the natives being carefully inspected. Fresh coverslip preparations were taken from every person who looked ill or who had previously been reported as having been ill, and any native presenting symptoms which were regarded as in any way suspicious was kept under observation until a diagnosis was made.

A number of natives were taught to make thick and thin blood smears and were detailed each to his own area, to patrol it regularly, and to report all cases of sickness and deaths. These patrols took blood-smears from every sick person and sent them to Ngani for examination. Several cases were found by this means, but they were almost invariably in an advanced stage, and not infrequently died before admission to Camp.

A Census was made by which the adult population of the Proclaimed Area was found to be 15,426, and of these 3 per cent had during the past fifteen months died from Trypanosomiasis. The villages in and near the endemic centre have a population of 2,932 adult inhabitants, and of these 1.26 per cent had been diagnosed as infected. Certain isolated villages reporting a heavy death-rate were removed to the hills, but no extensive depopulation was attempted. None however were left within the fly area proper. A few villages situated on its border showed an adult death-rate varying from 100 to 150 per mille, and 41.6 per cent of these deaths were due to Trypanosomiasis, while a further 19 per cent were regarded as suspicious.

In view of the fact that all cases were found either living in country infested with *G. morsitans*, or were shown to have recently visited such country, and further that the number of infected persons and of deaths in any village was in some measure proportionate to the amount of fly in the immediate neighbourhood, this species of tsetse is being regarded as the causative factor in our local infections.

Investigations are at present being made on an extended scale so as to embrace all the large fly areas in the West Nyasa, Marimba, Dowa, Dedza, South Nyasa and Upper Shire districts, each of which will be systematically examined by Medical Officers specially detailed for this duty. A careful search is to be made for cases of Sleeping Sickness in these localities, and the fly-areas are to be accurately mapped out. Medical Officers have been instructed to treat any and all cases of sickness they may encounter, in order to gain the confidence of the natives and thus to place themselves in a better position to find cases than by following the more direct methods hitherto adopted, and which no doubt resulted in the concealment of a large number of sick persons.

For a clinical history of the cases which have come under observation at the Ngani Segregation Camp, and of the results of treatment, reference should be made to Section VI. of this report.

Tick Fever is prevalent in the districts bordering the Lake but cases have come very little under the notice of Medical Officers who have been mostly stationed in the southern districts where the infecting tick is seldom met with.

Filariasis. A few cases of elephantiasis are occasionally seen, and these mostly in the Lower Shire and North Nyasa districts. The scrotum would appear to be involved almost as frequently as the lower extremities.

INFECTIOUS OR EPIDEMIC.

Small-pox. Seventy-eight cases of Small-pox, with fifteen deaths, were recorded during the year, as compared with 236 in the previous year. Notwithstanding that these cases were reported from six widely separated localities there was no spread of the infection to neighbouring villages in consequence of the promptness of the measures taken. In two of these areas the infection was clearly demonstrated to have been introduced by natives entering the Protectorate from adjacent territories, and this is a danger which needs to be constantly guarded against. The number of vaccinations performed during the year will be found under the head of preventive measures.

Diphtheria. A sporadic outbreak of diphtheria occurred at Zomba during the year, two Europeans and four natives being affected. The first case diagnosed was a Nursing Sister in the European Hospital, but the source of infection could not be ascertained. Later, a systematic examination of native servants and their families revealed the four cases referred to, and among this number a child, aged twelve months, died. A case of diphtheria occurred in Blantyre also, in a male adult who had not been away from Blantyre for some time; the source of infection here again could not be traced.

Enteric. It is more than probable that infection in this case, (an official residing in Zomba), was contracted within the precincts of the town. The disease is known to occur among natives, but whether it is disseminated by pollution of the water, or whether they act as "carriers" only, it is difficult to determine. The necessity in Zomba for a pipeborne water supply is drawn attention to in this connection.

Dysentery. There were 317 cases of dysentery, with five deaths, recorded during the year. The disease reaches its maximum incidence at the beginning of the wet season, owing to the scarcity, and presumably the pollution, of the then existing water supplies.

Liver Abscess. One case of liver abscess was returned from Blantyre, the subject being a European and the disease terminating fatally. Another case in a native, also ending fatally, was reported from Fort Johnston.

Pneumonia. Seventy-four cases and four deaths were reported. The disease cannot be said to have been prevalent either during the past year or the year preceding.

Phthisis. While Phthisis is of comparatively rare occurrence among natives of the Protectorate, evidence is now accumulating that it is gradually being introduced into the country from South Africa by natives returning from the Mines. Recent examinations of repatriates have disclosed a high percentage of tubercular disease of the lungs, and legislation will be necessary in order to prevent such an infection being introduced among a population which to a marked extent must be more or less non-immune. An examination of three batches of repatriates recently made yielded the following results:—(1). Number examined, 50; positive cases of phthisis, 4; suspicious, 2;

(2). Number examined, 24; positive cases, 3; suspicious, 3;

(3). Number examined, 23; positive cases, 3; suspicious, 3.

Beriberi. There were eleven cases of beriberi, with one death, as against twenty-four cases in the preceding year.

Pellagra. In the year 1910-11, Dr. Stannus observed a number of cases of a skin eruption among the inmates of the Central Prison at Zomba, which after further careful study enabled him to arrive at a diagnosis of pellagra. With the exception of Robben Island this is the first instance I believe of the occurrence of this disease in Africa south of Egypt. About 18 cases in all, with three deaths, have been observed up to the present, and further attention will be devoted to the subject.

Leprosy. Only four cases of leprosy have been returned, but these merely represent the number applying for treatment. Twenty cases have been actually observed in the Lower Shire district (population 24,940), and thirty-three in the Ruo district (population 26,680). The disease has a higher incidence in the neighbourhood of Lake Shirwa in the Zomba district, and a comparatively large number of cases are reported to exist in the Upper Shire district. Among the Lake districts the Dedza, Marimba and West Nyasa districts furnish the most cases.

Syphilis and other venereal diseases are reported to be on the increase, more especially in the towns, and not only among natives but Europeans. Thus the sick rates of Europeans in Blantyre show 6.1 per cent for venereal diseases, those for malaria being 13.04 per cent.

HELMINTHIC.

Bilharziosis. An official was invalided for bilharziosis, but the infection was acquired elsewhere. Dr. Eldred, the Medical Officer of Blantyre, believes that a fairly large proportion of so-called dysentery among natives may be primarily due to helminthic infection, and points to the fact that of three natives attending his Dispensary for dysentery an examination of the stools gave the following result:—

- Case (1). Bilharzia. (rectal)
,, (2). Ankylostomes and Ascaris.
,, (3). do. do.

Ankylostomiasis. A preliminary enquiry conducted by Dr. Eldred resulted in the finding of positive evidence as to the existence of Ankylostomiasis in the North Nyasa district. The infection is said to be fairly prevalent by Dr. Laws of the Livingstonia Mission, and it has also been reported from the Mombera district. Dr. Stannus at Zomba has found the ova in several prisoners. As a necessary measure of prophylaxis, in towns, the erection of an adequate number of sanitarily designed Public Latrines and a pipe-borne water supply are therefore called for.

(b). **European Officials.**

In the Lower Shire and Ruo districts the health of officials has been fairly good; there have been no invalidings and no deaths. The same applies to the Blantyre district. In Zomba there has been a fair amount of sickness among officials, including a case each of diphtheria and enteric, and four have been invalided. The health of officials in the South Nyasa district has on the whole been good, there having been but three cases of malaria and one of dysentery reported.

(c). **General European Population.**

In the Blantyre district, of the more important diseases, the sick rates were as follows:—Malaria 13·04 per cent, venereal diseases 6·1, and digestive disorders, due presumably to the defective water supply 7·6 per cent. Invaliding rates are not available. There was one death from Black-water fever and one from Liver Abscess. In other districts the non-official European population is too small to admit of generalizations being made.

(d). **General Native Population.**

For this portion of the community no vital statistics are available.

TABLE SHOWING SICK, INVALIDING, AND DEATH RATES FOR
EUROPEAN OFFICIALS, PORT HERALD.

	1910.	1911.	1912.
Total No. of Officials resident	14	14	10
Average No. of resident	10	10	10
Total No. on Sick List	10	10	10
Total No. of days on Sick List	40	26	30
Average daily No. on Sick List	10	.07	.08
Percentage of Sick to av. No. resident	100%	100%	100%
Av. No. of days on Sick List for each patient	·4	2·6	3
Average Sick time to each resident	2·8	1·8	3
Total No. invalided	nil	1	nil
Percentage of Ivalidings to total resident	nil	7·1%	—
Total Deaths	—	1	—
Percentage of Deaths to total residents	—	7·1%	—
„ „ „ „ av. No. residents		10%	—
No. of cases of Sickness contracted away from residence.	nil	nil	nil

TABLE SHEWING SICK, INVALIDING, AND DEATH RATES FOR
EUROPEAN OFFICIALS, BLANTYRE.

						1911-12
Total No. of Officials resident	...	..	...	...	...	30
Average No. of do. do.	...	...	...	...	...	10
Total No. on Sick List	...	...	...	...	...	12
Total No. of days on Sick List	...	...	...	...	...	100
Average daily No. on Sick List	...	...	...	...	...	03
Percentage of Sick to average No. resident			...	...	...	120%
Av. No. of days on Sick List for each patient			...	...	..	8·3
Average Sick time to each resident		...	...		...	3·3 days
Total No. invalided	...	...	...	...	...	nil
Percentage of Invalidings	...	...	...	...	...	nil
Total Deaths	...	...	...	...	...	nil
No. of cases of Sickness contracted away from residence				...	...	nil

TABLE SHEWING SICK, INVALIDING, AND DEATH RATES FOR
EUROPEAN OFFICIALS, ZOMBA.

						1911-12
Total No. of Officials resident	...	...	...	...	...	43
Average No. of Officials resident	...	...	...	...	...	40
Total No. on Sick List	...	...	...	...	...	36
Average daily No. on Sick List	...	...	...	...	...	82
Percentage of Sick to average No. resident	...	...	...	...	...	99%
Average No. of days on Sick List for each patient	...	...	...	...	...	8.3
Average Sick time to each resident	...	...	...	...	...	7.2
Total No. invalided	...	...	...	...	...	4
Percentage of Invalidings to total residents	...	...	...	...	...	10%
Total Deaths	...	...	...	...	...	0
No. of cases of Sickness contracted away from residence	...	...	...	...	...	6

TABLE SHOWING SICK, INVALIDING, AND DEATH RATES FOR
EUROPEAN OFFICIALS, FORT JOHNSTON.

							1911-12
Total No. of Officials resident	...	...	...	...	...	...	6
Average „ „ „	...	...	...	...	...	...	6
Total No. on Sick List	...	...	...	...	...	...	2
Total No. of days on Sick List	...	...	...	...	...	...	9
Percentage of Sick to av. No. resident	...	...	...	...	...	...	33·3
Av. No. of days on Sick List for each patient	...	...	...	...	...	...	4·5
Av. Sick time to each resident	...	...	...	...	...	...	3·3 days
Total No. invalided	...	...	...	...	...	...	nil
Percentage of invalidings	...	...	...	...	...	...	„
Total Deaths	...	...	...	...	...	...	„
Percentage of Deaths	...	...	...	...	...	...	„
No. of cases of Sickness contracted away from residence	...	...	...	...	...	...	„

III. SANITATION.

There is no Sanitary Department in the Protectorate, the work of sanitation being attended to by Medical Officers who are, ex-officio, Medical Officers of Health of their respective stations.

1. Administrative.

The following Rules, Orders, Notices, &c. were passed during the year 1911.

(a). Town Councils Ordinance, 1908—Blantyre Town Council Rules.

(b). Epidemic and Contagious Diseases Ordinance, 1903-8—Sleeping Sickness Rules.

(c). Epidemic and Contagious Diseases Ordinance, 1903-8—Boundaries of the Sleeping Sickness Area, Dowa sub-district, defined. (Cancelling Schedule to (2).

2. Preventive Measures.

Mosquito and Insect-borne Diseases.

Malaria. The usual measures of prophylaxis are carried out at the various European settlements. A periodical clearing of weeds, undergrowth, and bush is made for the purpose of promoting evaporation, preventing the formation of puddles, and removing shelter for mosquitoes. All hollows and depressions where water is likely to collect and stagnate are filled up. On the lake and river stations boats and canoes are examined to ascertain whether they hold water. Native locations are provided for workers, at a distance from European dwellings. Houses occupied by Europeans are now largely protected with wire gauze netting except those in the hill stations, and the adoption of punkas also has been recommended for such as are situated on the lower levels, and the matter is to receive attention this year. Mosquito nets are in general use. Quinine prophylaxis has been made compulsory for officials by circular, and all cases of malaria occurring among Government officers are reported on a special form which also provides information on the attendant circumstances.

Trypanosomiasis. The only prophylactic measure of any value is the removal of infected cases from fly into fly-free areas, and this proceeding is in general adoption. Villages situated in or in close proximity to fly infested localities where cases of Trypanosomiasis have been observed have been concentrated in country which is free of fly. Europeans are advised when travelling in fly areas to protect themselves from being bitten in every possible way, by the use of head nets, white clothing, &c. and to avoid camping in such localities.

Filariasis. So far as our experience at present goes filarial infection in natives cannot be said to be common. Cases are only very occasionally observed.

Epidemic Diseases.

Small-pox. Vaccination. The lanolated lymph supplied by the Lister Institute of Preventive Medicine continues to give every satisfaction. Vaccination as a measure of prophylaxis is now thoroughly understood by natives, and no opposition is offered to the vaccinators. Appended is a list of the vaccinations performed during the past year. It is necessary to point out that these returns are approximate only. Constant supervision by a staff of Superintendents of Vaccination would be required in order to ensure any degree of accuracy in the figures returned. The natives of the country are incapable of performing this duty, and the employment of Sub-Assistant Surgeons would be prohibitive for financial reasons. The operations of the Vaccinators extend over some fifteen or sixteen districts and sub-districts of the Protectorate, and while Medical Officers are under instructions to supervise their work it is not possible to exercise the constant supervision which is necessary for accurate returns.

District.					Successful.	Modified.	Failed.	Not seen.
Lower Shire	...	...	...	...	3,419	267	142	43
Ruo	...	...	...	...	8,943	1,638	559	700
Blantyre	...	...	...	...	7,364	5,283	2,879	328
Zomba	...	...	...	...	4,953	2,016	1,486	2,279
Liwonde	...	...	...	...	5,005	390	332	1,734
Ncheu	...	...	...	...	2,796	399	360	334
South Nyasa	...	...	...	...	9,456	1,125	856	383
Mangoche	...	...	...	...	60	20	22	22
Dedza	...	...	...	...	192	15	43	72
Lilongwe	...	...	...	...	12,320	1,563	987	1,340
Kota Kota	...	...	...	...	8,742	2,355	1,786	921
Ngara	...	...	...	...	4,532	785	1,432	543
Mombera	...	...	...	...	3,059	142	552	311
North Nyasa	...	...	...	...	264	43	29	73
					71,105	16,041	11,458	9,083

3. General Measures.

Disposal of Night Soil. The dry earth system is in use throughout the country, the night soil being buried in pits in each householder's premises. While this method of disposal is no doubt suitable for small communities, in settlements such as Zomba and Blantyre where the population is appreciably growing, a more efficient mode of disposal and one that can be placed under proper control is necessary. On the one hand it is insanitary to have numbers of night soil pits scattered all over a township, and on the other the temptation for servants to wash the pails in the nearest stream of water is a danger which needs to be guarded against.

Further, owing to the large number of domestic servants and other native employees residing or working in the township, adequate provision needs to be made for this portion of the community, and a large number of Public Latrines is required. In the absence of a sufficiency of these there is always danger of the surface soil being polluted by natives. Ankylostomiasis, as already pointed out, is known to exist in the Protectorate, and the spread of such infections and of fly-borne diseases must be guarded against.

Disposal of Refuse. The existing practice is to throw all refuse into pits excavated for this purpose, and the pit when full is covered over with earth. The great objection to this mode of disposal of refuse, however, is that these pits provide breeding grounds for flies which become a nuisance during certain seasons of the year, and the danger of fly-borne diseases is correspondingly increased.

A scheme of Conservancy for Zomba township has accordingly been recommended which is modelled on the system introduced into Khartoum by Dr. Anderw Balfour, and which with but few modifications in some of its details can be readily applied here. The question of the cost of this scheme has been carefully gone into, and the proposal will in due course be submitted to his Excellency the Governor for consideration. The main requirements for giving effect to this system of Conservancy may be briefly outlined as follows:—(1). The provision of two pails, with lids, for each private latrine; the pails are used on alternate days, so that when the soiled pail is taken away the clean one is substituted. (2). A similar arrangement for native Public Latrines, namely a double set of pails. (3). A cemented brick tank for holding water for washing soiled pails. (4). A building for storing pails that have been cleansed. (5). Dust bins for collection of refuse. (6). Incinerator for the destruction of night soil, and refuse from dust bins. (7). Carts for carrying night soil pails and dust bins to incinerator. (8). A staff of night soil men, and drivers for the carts.

Water Supply. As pointed out in previous reports the sources of water supply vary at the different stations. Water for domestic purposes is drawn from the Lake, river, springs and mountain streams, and in the case of Blantyre mainly from wells. Whatever the source of water supply it is necessary to boil all drinking water; and the necessity for taking this precaution is duly impressed upon householders, as too much reliance is placed on filters which if neglected are a source of danger.

The water supply of Blantyre leaves much to be desired. It is insufficient for the growing needs of the town, and its quality is moreover questionable. The supply is obtained almost solely from wells, the majority of which are so shallow as to leave no room for doubt but that they are largely replenished with water that has percolated from the surface. Filtering and then boiling is therefore all the more necessary here to make the water potable. Any scheme for supplying pipe-borne water to Blantyre would be costly as it would need to be brought from a distance, and therefore although the water supply has been repeatedly condemned the question of cost has stood in the way, and the conditions remain in statu quo ante.

As regards Zomba a service of pipe-borne water would be a great advantage, and there is a mountain stream in the immediate neighbourhood which can be readily tapped to supply the whole town. A case of enteric has recently occurred in Zomba, and when it is remembered that servants will surreptitiously wash any and all utensils in the water channels which flow through the township the necessity for a pipe-borne water supply cannot be too strongly emphasised. These water channels moreover afford breeding grounds for mosquitoes and they could be largely done away with if a pipe system of supply was installed.

Drainage. Subsoil drainage has not been attempted but provision is made for carrying off storm water in specially constructed channels. These however are not satisfactory, as unless carefully attended to they afford breeding grounds for mosquitoes. Properly graded brick drains are necessary, especially at the hill stations. Covered drains which are generally recommended for the tropics would not be effective, as they would get blocked with vegetation after every heavy rainfall and silt up; the cost of their construction, moreover, would much exceed that of open drains.

Clearance of bush, undergrowth, &c. This is attended to at all stations, and the grass is cut down, both during and at the end of the wet season.

TABLE IV.

SUMMARY OF ROUTINE SANITARY WORK DONE DURING THE YEAR IN THE TOWN

1. NAME OF TOWN—PORT HERALD.

—					Approximate area.	No. of proclaimed open spaces.
1910	...	...	...	..	200 acres.	132 acres.
1911	...	...	...	...	"	124 "
1912	...	...	...	...	"	100 "

2. POPULATION.

—					Number of Natives.		Number of Europeans.		Total.
					Males.	Females.	Males.	Females.	
1910	...	...	...	...	...	...	...	...	...
1911	...	...	...	...	250	30	11	...	291
1912	...	...	...	...	150	60	14	2	226

3. HOUSING.

—					Number occupied by Europeans.	Number occupied by Natives.
Number of Houses:—						
1910	...	...	...	...	17	...
1911	...	...	...	...	21	...
1912	...	...	...	...	26	...
Number of Huts:—						
1910	...	...	...	..	Not recorded.	
1911	...	...	...	...	"
1912	...	...	...	...	"

4. MOSQUITO PROTECTION OF HOUSES.

—					1910.	1911.	1912.
Number of European houses wholly mosquito-protected					...	2	3
Number of European houses with mosquito room					...	1	1
Number rendered during the year wholly mosquito-protected				
Number rendered during the year partially mosquito-protected				

5. ERECTION OF NEW BUILDINGS DURING THE YEAR.

—					1910	1911.	1912.
Number of public buildings erected with sanction as to site, construction, and relation to other buildings.					1	...	2
Number of houses erected with sanction as to site, construction and relation to other buildings.					...	1	4
Number of huts erected with sanction as to site, construction and relation to other buildings.					...	...	...
Number of houses built without sanction					...	...	...
Number of Huts built without sanction					...	...	...

ACTION TAKEN.

	Number of Prosecutions.		Number demolished.	
	Huts.	Houses.	Huts.	Houses.
1910	nil.		nil.	
1911	"		"	
1912	"		"	

6. MARKETS.

	Total number.	Number paved and drained.	Number unpaved.
1910	nil.	nil.	nil.
1911	"	"	"
1912	"	"	"

7. SLAUGHTER HOUSES.

	Total number.	Number paved and drained.	Number unpaved.
1910	nil.		
1911			
1912			

8. LATRINES.

	For Males.		For Females.	
	Number.	Number of seats.	Number.	Number of seats.
Number of Public Latrines:—				
1910	3	...	2	...
1911	3	...	3	...
1912	4	...	3	...
Number of New Public Latrines erected during the year :—				
1910 ... ..	...	...	...	...
1911 ... ..	...	...	...	...
1912	2	...	2	...
Number of Public Latrines repaired during the year :—				
1910 ... ..	...	...	...	...
1911 ... ..	...	...	...	...
1912	2	...	1	...
Number of Public Latrines demolished during the year :—				
1910 ... ..	...	...	...	...
1911 ... ..	...	...	...	...
1192	2	...	2	...
		1910.	1911.	1912.
Number of Private Latrines		25	28	37
Average number of pails of nightsoil removed daily ..		...	...	...
Average number of soiled pails removed and clean pails substituted		...	...	...
Number of night soil men employed to clean latrines and remove excreta.		...	...	...
Number of cesspools ... ..		...	...	...
Number of cesspools cleansed ... ..		...	...	...
Number of new cesspools constructed during the year		...	...	...
Number of old cesspools abolished ... ..		...	...	...
Number of old cesspools oiled regularly by Department		...	...	...

9. REMOVAL OF REFUSE.

	1910.	1911.	1912.
Number of Dust bins
Number of carts at work daily to remove refuse from streets
Amount of refuse removed daily
Number of carts at work daily to remove refuse from yards and premises
Amount of refuse remove daily from yards and premises
Nvmber of men employed for removing refuse	Done	privately	...

10. MODE OF DISPOSAL OF EXCRETA REFUSE, AND OFFAL.

—	Daily average number of pails of excreta.			Daily average number of cartloads of Refuse.			Daily average number of cartloads Slaughter House and Market Offal.		
	1910.	1911.	1912.	1910.	1911.	1912.	1910.	1911.	1912.
Buried or trenched	buried	”	”	Nil	”	”	Nil	”	”
Burnt	”	”	”	”	”	”	”	”	”
Thrown into sea	”	”	”	”	”	”	”	”	”
* Otherwise dealt with	”	”	”	”	”	”	”	”	”

* State mode of disposal.

II. AVERAGE DAILY NUMBER OF CARTLOADS OF TIN CANS, BOTTLES, BROKEN CROCKERY, AND OTHER INCOMBUSTIBLE MATERIAL REMOVED FROM HOUSES, HUTS, AND COMPOUNDS.

1910.	1911.	1912.
Not estimated.	”	”

12. WATER SUPPLY.

Nature of Water Supply	1910.	1911.	1912.
Pipe-borne water —			
Source (river, lake, or spring) :—	Water drawn from the River Shire.		
Number of linear yards			
Number of stand-pipes along roads			
Number of stand-pipes in compound s and houses			
Wells :—			
Public :—			
Number	”	”	”
Number with pumps protected against surface water and mosquito-protected			
Private :—			
Number	2	2	2
Number protected against surface water and mosquito protected			
Tanks :—			
Public :—			
Number underground	Nil	Nil	Nil
Number mosquito-protected and served by pumps			
Number above ground			
Number mosquito-protected			
Number of 400 gallons capacity or less			
Number above 400 gallons			
Private :—			
Number underground	Nil	Nil	Nil
Number mosquito protected			
Number above ground			
Number mosquito protected			
Number of 400 gallons capacity or less			
Number above 400 gallons			
Nature of Tanks :—			
Wood	”	”	”
Iron			
Concrete			
Barrels :—			
Number	”	”	”
Number mosquito protected			

13. DRAINAGE.

Nature of drainage.	Public.	Private.
Masonry drains :—		
Lineal yards of masonry drains :—		
1910	35 yards	Nil.
1911	"	"
1912	"	"
Lineal yards recons tructed during the year :—	"	"
1910		
1911		
1912		
Lineal yards repaired during the year :—	"	"
1910		
1911		
1912		
Lineal yards of new drains constructed during the year :—	Nil	Nil.
1910		
1911		
1912		
Earth drains or ditches :—		
Number of linear yards of ditches cleaned :—	Cleaned periodically.	
1910 ... ..	...
1911 ... ..	...
1912 ... ..	...
Number of linear yards of dithes dug and graded :—	...	
1910 ... ..	...
1911 ... ..	...
1912 ... ..	...
Average frequency of clearing ditches of grass :—	...	
1910 ... ..	...
1911 ... ..	...
1912 ... ..	...

14. CLEARANCE OF UNDERGROWTH LONG GRASS, AND JUNGLE.

	1910	1911.	1912
Number of square yards of weeds, grass, and vegetation out and removed	At regular		
Average frequency of clearance of rank vegetation on same area ...	intervals.		

15. EXCAVATIONS AND LOW-LYING LAND.

	1910	1911	1912
Number of pools and excavations	Nil	Nil	Nil
Number of excavations filled up	"	"	"
Amount of low-lying and march land raised and drained	"	"	"
Number of pools, marshes, &c. fish-stocked	"	"	"
Number of cubic yards of material used for filling up pools and excava- tions	"	"	"
Number of persons fined for making new excavations	"	"	"
Average number of men daily employed in filling up pools &c	"	"	"

16. OILING.

	1910	1911	1912
Number of drains oiled
Number of pools and excavations oiled	1
Number of tanks and barrels oiled
Average number of men daily employed for oiling drains, pools, and watertanks of barrels

17. INSPECTIONS AND PROSECUTIONS.

	1910	1911	1912
Number of inspectors employed	Nil	Nil.	Nil
Number of houses inspected	Inspections	"	"
Number of houses where larvae were found	are made by	"	"
Number of notices served to remove conditions causing the breeding of larvae	the Medical Officer.	"	"
Number of persons fined for having mosquito larvae on premises ...	—	"	"
Number of notices served to remove insanitary conditions on premises ...	—	"	"
Number of persons fined for not removing insanitary conditions after notice		"	"
Number of soda and aerated water factories inspected			

TABLE IV
SUMMARY OF ROUTINE SANITARY WORK DONE DURING THE YEAR IN THE TOWN.
1. NAME OF TOWN—CHIROMO.

	Approximate area.	Number of proclaimed open spaces.
1910	113 acres.	54 acres.
1911	"	"
1912	"	"

2. POPULATION.

	Number of Natives.		Number of Europeans.		Total.
	Males.	Females.	Males	Females.	
1910 ... ..	...	...	10	2	...
1911	261	84	9	1	355
1912	60	20	6	1	87

3. HOUSING.

	Number occupied by Europeans.	Number occupied by Natives.
Number of Houses :—		
1910	20	...
1911	8	61
1912	9	30
Number of Huts :—		
1910 ... ..	...	...
1911 ... ..	...	...
1912 ... ..	...	...

4. MOSQUITO PROTECTION OF HOUSES.

	1910	1911.	1912.
Number of European houses wholly mosquito-protected	Nil.	Nil.	Nil.
Number of European houses with mosquito room	3	3	3
Number rendered during the year wholly mosquito-protected	Nil.	Nil.	Nil.
Number rendered during the year partially mosquito-protected ... ..	...	1	...

5. ERECTION OF NEW BUILDINGS DURING THE YEAR.

	1910.	1911.	1912.
Number of public buildings erected with sanction as to site, construction, and relation to other buildings.	Nil.	Nil.	2
Number of houses erected with sanction as to site, construction and relation to other buildings.	4
Number of huts erected with sanction as to site, construction, and relation to other buildings.
Number of houses built without sanction
Number of huts built without sanction

ACTION TAKEN.

	Number of Prosecutions.		Number demolished.	
	Huts.	Houses	Huts.	Houses.
1910	Nil.		10	...
1911	"		1	...
1912 ... ..	"		...	...

6. MARKETS.

	Total number.	Number paved and drained.	Number unpaved.
1910	Nil.	Nil.	Nil.
1911 ... ..	...	...	...
1912 ... ..	...	...	...

7. SLAUGHTER HOUSES.

	Total number.	Number paved and drained.	Number unpaved.
1910	Nil.	Nil.	Nil.
1911 ... ..	...	...	...
1912 ... ..	...	...	...

8. LATRINES.

	For Males.		For Females.	
	Number.	Number of seats.	Number.	Number of seats.
Number of Public Latrines :—				
1910	2	...	2	...
1911	2	...	2	...
1912	2	...	2	...
Number of new Public Latrines erected during the year :—				
1910	2	...	2	...
1911	2	...	2	...
1912 ... ..	...	...	...	...
Number of Public Latrines repaired during the year :—				
1910 ... ..	...	...	...	...
1911	1	...	1	...
1912	2	...	1	...
Number of Public Latrines demolished during the year :—				
1910 ... ..	...	...	...	...
1911 ... ..	...	...	...	...
1912 ... ..	...	...	...	...

8. LATRINES.—*Continued.*

	1910.	1911.	1912.
Number of Private Latrines	19	15
Average number of pails of nightsoil removed daily..
Average number of soiled pails removed and clean pails substituted
Number of nightsoil men employed to clean latrines and remove excreta	One to each latrine.		
Number of cesspools
Number of cesspools cleansed
Number of new cesspools constructed during the year
Number of old cesspools abolished
Number of cesspools oiled regularly by Department

9. REMOVAL OF REFUSE.

	1910.	1911.	1912
Number of dustbins
Number of carts at work daily to remove refuse from seats
Amount of refuse removed daily
Number of carts at work daily to remove refuse from yards and premises
Amount of refuse removed daily from yards and premises
Number of men employed for moving refuse	8	8	8

10. MODE OF DISPOSAL OF EXCRETA, REFUSE, AND OFFAL.

	Daily average number of pails of excreta.			Daily average number of cartloads of refuse.			Daily average number of cartloads of Slaughter House and Market Offal.		
	1910.	1911.	1912.	1910.	1911.	1912.	1910.	1911.	1912.
Buried or trenched	Buried	...	...	...	...	...	Nil.	Nil.	Nil.
Burnt ... ..	...	...	...	...	...	...	...	...	...
Thrown into sea ... ..	...	...	...	...	...	...	...	...	...
* Otherwise dealt ... ..	...	...	...	...	...	...	...	...	...

* State mode of Disposal.

11. AVERAGE DAILY NUMBER OF CARTLOADS OF TIN CANS, BOTTLES, BROKEN CROCKERY, AND OTHER INCOMBUSTIBLE MATERIAL REMOVED FROM HOUSES, HUTS AND COMPOUNDS

1910.	1911.	1912.
Not estimated.	„	„

12. WATER SUPPLY.

Nature of Water Supply.	1910.	1911.	1912.
Pipe-borne water:—			
Source (river, lake, or spring):—	Water is obtained from the Ruo river.		
Number of linear yards			
Number of stand-pipes along roads			
Number of stand-pipes in compounds and houses			
Wells:—			
Public:—			
Number	Nil.	Nil.	Nil.
Number with pumps protected against surface water and mosquito-protected	"	"	"
Private:—			
Number	"	"	"
Number protected against surface and mosquito protected	"	"	"
Tanks:—			
Public:—			
Number underground			
Number mosquito-protected and served by pumps			
Number above ground			
Number mosquito-protected			
Number of 400 gallons capacity or less			
Number above 400 gallons			
Private:—			
Number underground			
Number mosquito-protected			
Number above ground	"	"	"
Number mosquito-protected			
Number of 400 gallons capacity or less			
Number above 400 gallons			
Nature of Tanks:—			
Wood			
Iron			
Concrete			
Barrels:—			
Number	4	4	4
Number mosquito-protected			

13. DRAINAGE.

Nature of drainage.	Public.	Private.
Masonry drains:—		
Lineal yards of masonry drains:—		
1910	260 yds.	
1911	300 "	
1912	300 "	
Lineal yards reconstructed during the year:—		
1910	Nil.	
1911	"	
1912	"	
Lineal yards repaired during the year:—		
1910	"	
1911	"	
1912	"	
Lineal yards of new drains constructed during the year:—		
1910	100 yds.	
1911	60 "	
1912	Nil.	
Earth drains or ditches:—		
Number of linear yards of ditches cleaned:—		
1910		
1911		
1912		
Number of linear yards of ditches dug and graded:—		
1910		
1911		
1912		
Average frequency of clearing ditches of grass:—	Periodically.	
1910		
1911		
1912		

14. CLEARANCE OF UNDERGROWTH LONG GRASS, AND JUNGLE.

	1910.	1911.	1912.
	59 acres.	59 acres.	38 acres.
Number of square yards of weeds, grass, and vegetation cut and removed ...	Periodically.	Periodically	Periodically
Average frequency of clearance of rank vegetation on same area			

15. EXCAVATIONS AND LOW-LYING LAND.

	1910.	1911.	1912.
Number of pools and excavations	Nil	Nil	Nil
Number of excavations filled up	"	"	"
Amount of low-lying and marsh land raised and drained	"	"	"
Number of pools, marshes, &c. fish-stocked	"	"	"
Number of cubic yards of material used for filling up pools and excavation	"	"	"
Number of persons fined for making new excavations	"	"	"
Average number of men daily employed in filling up pools, &c.	"	"	"

16. OILING.

	1910.	1911.	1912.
Number of drains oiled	Nil.	Nil.	Nil.
Number of pools and excavations oiled	"	"	"
Number of tanks and barrels oiled	"	"	"
Average number of men daily employed for oiling drains, pools, and watertanks or barrels	"	"	"

17. INSPECTIONS AND PROSECUTIONS.

	1910.	1911.	1912.
Number of inspectors employed	1	1	1
Number of houses inspected	No record.	No record.	No record.
Number of houses where larvae were found	" "	"	"
Number of notices served to remove conditions causing the breeding of larvae	"	"	"
Number of persons fined for having mosquito larvae on premises	" "	"	"
Number of notices served to remove insanitary conditions on premises	" "	"	"
Number of persons fined for not removing insanitary conditions after notice	" "	"	"
Number of soda and aerated water factories inspected	" "	"	"

TABLE IV.
SUMMARY OF ROUTINE SANITARY WORK DONE DURING THE YEAR IN THE TOWN.
1. NAME OF TOWN—BLANTYRE.

	Approximate area.	Number of proclaimed open spaces.
1910 1911 1912	1685 acres.	1. Boma square. 2. Sports ground. 3. Golf links.

2. POPULATION.

	Number of Natives.		Number of Europeans.		Total.
	Males.	Females.	Males.	Females.	
1910 1911 1912	About 900		About 168 District 110		

3. HOUSING.

—				Number occupied by Europeans.	Number occupied by Natives.
Number of Houses :—					
1910	...	...	...	22	By Asiatics, 35 „ Natives, No record.
1911	...	...	...	22	
1912	...	...	..	26	
Number of Huts :—					
1910	...	...	...	No record.	
1911	...	...	...	”
1912	...	...	...	..

4. MOSQUITO PROTECTION OF HOUSES.

—				1910.	1911.	1912.
Number of European houses wholly mosquito-protected				1	1	1
Number of European houses with mosquito room				...	...	...
Number rendered during the year wholly mosquito-protected				...	..	1
Number rendered during the year partially mosquito-protected				...	...	..

5. ERECTION OF NEW BUILDINGS DURING THE YEAR.

—				1910.	1911.	1912.
Number of public buildings erected with sanction as to site, construction, and relation to other buildings				3	2	1
Number of houses erected with sanction as to site, construction, and relation to other buildings				...	...	4
Number of huts erected with sanction as to site, construction, and relation to other buildings.				...	...	...
Number of houses built without sanction				...	...	...
Number of huts built without sanction				...	...	...

ACTION TAKEN.

—				Number of Prosecution.		Number demolished.	
				Huts.	Houses.	Huts.	Houses.
1910	1	...	...
1911
1912

6. MARKETS.

—							Total Number.	Number paved and drained	Number unpaved.
1910	...	...	...	...	...	...	1	...	1
1911	..	...	...	...	...	...	1	...	1
1912	...	...	...	...	...	...	1	...	1

7. SLAUGHTER-HOUSES.

—							Total number.	Number paved and drained.	Number unpaved.
1910	...	...	...	...	...	...	...	...	...
1911	...	...	...	...	...	...	1 (private.	...	1
1912	...	...	...	...	...	...	1 „	...	1

8. LATRINES.

—							For Males.		For Females.	
							Number.	Number of seats.	Number.	Number of seats.
Number of Public Latrines:—										
1910	...	...	...	...	...	...	1	...	1	...
1911	...	...	...	...	...	...	1	...	1	...
1912	..	...	...	...	...	...	1	...	1	...
Number of new Public Latrines erected during the year:—										
1910	...	...	...	...	...	...	1	...	1	...
1911	..	...	...	...	...	...	...	...	...	...
1912	...	...	...	...	...	...	2	...	2	...
Number of Public Latrines repaired during the year:—										
1910	...	...	...	...	..	...	...	...	...	...
1911	...	...	...	...	...	...	...	...	...	...
1912	...	...	...	...	...	...	...	...	...	...
Number or Public Latrines demolished during the year:—										
1910	...	...	...	...	...	...	1	...	...	...
1911	...	...	...	...	...	...	...	...	...	...
1912	...	...	...	...	...	...	2	...	2	...
								1910.	1911.	1912.
Number of Private Latrines							...	1 to each	house occupied	by Euro-
Average number of pails of nightsoil removed daily							...	peans and to	most Asiatic	houses.
Average number of soiled pails removed and clean pails substituted							...	...	...	...
Number of nightsoil men employed to clean latrines and remove excreta.							...	...	...	...
Number of cesspools							...	...	...	...
Number of cesspools cleansed							...	...	...	...
Number of new cesspools constructed during the year							...	...	...	...
Number of old cesspools abolished							...	...	...	...
Number of cesspools oiled regularly by Department...							...	...	...	...

9. REMOVAL OF REFUSE.

—							1910.	1911.	1912.
Number of dustbins							No dust bins.		...
Number of carts at work daily to remove refuse from seats							Refuse burnt.		...
Amount of refuse removed daily...							...	...	...
Number of carts at work daily to remove refuse from yards and premises.							...	...	...
Amount of refuse removed daily from yards and premises							...	...	...
Number of men employed for moving refuse							...	...	...

10. MODE OF DISPOSAL OF EXCRETA, REFUSE, AND OFFAL.

—				Daily average number of pails of excreta.			Daily average number of cartloads of refuse.			Daily average number of cartloads of Slaughter House and Market Offal.		
				1910.	1911.	1912.	1910.	1911.	1912.	1910.	1911.	1912.
Buried or trenched	...	...	..	Buried	...	...	Nil.	...	...	Nil.	...	...
Burnt	...	...	...	...	...	...	...	...	...	...	...	...
Thrown into sea	...	...	...	...	...	...	...	...	...	...	...	...
* Otherwise dealt with	...	...	...	...	...	...	..	...	...	...	...	...

* State mode of Disposal.

11. AVERAGE DAILY NUMBER OF CARTLOADS OF TIN CANS, BOTTLES, BROKEN CROCKERY, AND OTHER INCOMBUSTIBLE MATERIAL REMOVED FROM HOUSES, HUTS AND COMPOUNDS.

1910.	1911.	1912.
No record.	"	"

12. WATER SUPPLY.

Nature of Water Supply.	1910.	1911.	1912.
Pipe-borne water :—			
Source (river, lake, or spring) :—	"	"	"
Number of linear yards			
Number of stand-pipes along roads			
Number of stand-pipes in compounds and houses			
Wells :—			
Public :—			
Number	1	1	1
Number with pumps protected against surface water and mosquito protected			
Private :—			
Number	2	2	2
Number protected against surface and mosquito protected			
Tanks :—	"	"	"
Public :—			
Number underground			
Number mosquito protected and served by pumps			
Number above ground			
Number mosquito protected			
Number of 400 gallons capacity or less			
Number above 400 gallons			
Private :—	"	"	"
Number underground			
Number mosquito protected			
Number above ground			
Number mosquito protected			
Number of 400 gallons capacity or less			
Number above 400 gallons	"	"	"
Nature of Tanks :—			
Wood			
Iron			
Concrete			
Barrels :—	"	"	
Number			
Number mosquito protected			

13. DRAINAGE

Nature of drainage.	Public.	Private.
Masonry drains :—		
Lineal yards of masonry drains :—		
1910	A few brick the	roads with drains on sides.
1911		
1912		
Lineal yards reconstructed during the year :—		
1910		
1911		
1912		
Lineal yards repaired during the year :—		
1910		
1911		
1912		
Lineal yards of new drains constructed during the year :—		
1910		
1911		
1912		
Earth drains or ditches :—		
Number of linear yards of ditches cleaned :—		
1910		
1911		
1912		
Number of linear yards of ditches dug and graded :—		
1910		
1911		
1912		
Average frequency of clearing ditches of grass :—		
1910		
1911		
1912		

14. CLEARANCE OF UNDERGROWTH LONG GRASS, AND JUNGLE

	1910.	1911.	1912.
Number of square yards of weeds, grass and vegetation cut and removed	No	record.	
Average frequency of clearance of rank vegetation on same area ...	Cleared	periodic	ally.

15. EXCAVATIONS AND LOW-LYING LAND.

	1910.	1911.	1912.
Number of pools and excavations	No	record.	
Number of excavations filled up			
Amount of low-lying and marsh land raised and drained			
Number of pools, marshes, fish-stocked			
Number of public yards of material used for filling up pools and excavations			
Number persons fined for making new excavations — — —			
Average number of men daily employed in filling up pools &c. — —			

16. OILING.

	1910.	1911.	1912.
Number of drains oiled — — — ... — — — —			
Number of pools and excavations oiled — — — — —			
Number of tanks and barrels oiled — — — — —	None	—	
Average number of men employed for oiling drains pools, and watertanks or barrels — — — — — — — — —			

17. INSPECTIONS AND PROSECUTIONS.

	1910.	1911.	1912.
Number of inspectors employed —	Nil.	M. O.	Inspects.
Number of houses inspected —	"	"	2
Number of houses where larvae were found —	"	"	2
Number of notices served to remove conditions causing the breeding of larvae	"	"	2
Number of persons fined for having mosquito larvae on premises ...	"	"	14
Number of notices served to remove insanitary conditions on premises	"	"	
Numbe of persons fined for not removing insanitary conditions after notice — — — — — — — — —	"	1	6
Number of soda and aerated water factories inspected — — —	"	"	2

TABLE IV.
SUMMARY OF ROUTINE SANITARY WORK DONE DURING THE YEAR IN THE TOWN

1. NAME OF TOWN—ZOMBA.

—					Approximate area.	No. of proclaimed open spaces.
1910	...	...	...	...	1050 acres.	Golf links.
1911	...	...	...	...		Sports grounds
1912	...	...	...	...		Botanical gardens

2. POPULATION.

—					Number of Natives.		Number of Europeans.		Total.
					Males.	Females.	Males.	Females.	
1910	...	...	...	...	229	79	59	24	391
1911	...	...	...	...	237	84	57	29	407
1912	...	...	...	...	200	70	62	28	360

3. HOUSING.

—					Number occupied by Europeans.	Number occupied by Natives.
Number of Houses :—						
1910	...	...	...	...	57	...
1911	...	...	...	...	62	...
1912	...	...	...	...	62	Indians 25
Number of Huts :—						
1910	...	...	...	...	Few	
1911	...	...	...	...	"
1912	...	...	...	...	"

4. MOSQUITO PROTECTION OF HOUSES.

—					1910.	1911.	1912.
Number of European houses wholly mosquito-protected					Nil	Nil	Nil
Number of European houses with mosquito room					"	"	"
Number rendered during the year wholly mosquito-protected					"	"	"
Number rendered during the year partially mosquito-protected					"	"	"

5. ERECTION OF NEW BUILDINGS DURING THE YEAR.

—					1910	1911.	1912.
Number of public buildings erected with sanction as to site, construction, and relation to other buildings.					Nil	Nil	Nil
Number of houses erected with sanction as to site, construction and relation to other buildings.					...	5	...
Number of huts erected with sanction as to site, construction and relation to other buildings.					...	...	...
Number of houses built without sanction					...	...	...
Number of Huts built without sanction					...	...	...

ACTION TAKEN.

	Number of Prosecutions.		Number demolished.	
	Huts.	Houses.	Huts.	Houses.
1910	nil.		nil.	
1911	"		"	
1912	"		"	

6. MARKETS.

	Total number.	Number paved and drained.	Number unpaved.
1910	1	nil.	1
1911	1	"	1
1912	1	"	1

7. SLAUGHTER HOUSES.

	Total number.	Number paved and drained.	Number unpaved.
1910	nil.	nil.	nil.
1911			
1912			

8. LATRINES.

	For Males.		For Females.	
	Number.	Number of seats.	Number.	Number of seats.
Number of Public Latrines:—				
1910	6	...	4	...
1911	"	...	"	...
1912	7	...	5	...
Number of New Public Latrines erected during the year :—				
1910				
1911				
1912				
Number of Public Latrines repaired during the year :—				
1910	All	repaired		
1911				
1912				
Number of Public Latrines demolished during the year :—				
1910				
1911				
1912				

	1910.	1911.	1912.
Number of Private Latrines	58	57	60
Average number of pails of nightsoil removed daily
Average number of soiled pails removed and clean pails substituted
Number of night soil men employed to clean latrines and remove excreta.
Number of cesspools
Number of cesspools cleansed
Number of new cesspools constructed during the year
Number of old cesspools abolished
Number of old cesspools oiled regularly by Department

9. REMOVAL OF REFUSE.

	1910.	1911.	1912.
Number of Dust bins	Refuse removed and buried.	privately.	
Number of carts at work daily to remove refuse from streets			
Amount of refuse removed daily			
Number of carts at work daily to remove refuse from yards and premises			
Amount of refuse remove daily from yards and premises			
Number of men employed for removing refuse			

10. MODE OF DISPOSAL OF EXCRETA REFUSE, AND OFFAL.

	Daily average number of pails of excreta.			Daily average number of cartloads of Refuse.			Daily average number of cartloads Slaughter House and Market Offal.		
	1910.	1911.	1912.	1910.	1911.	1912.	1910.	1911.	1912.
Buried or trenched	From	public	latrines	by trenching.					
Burnt	From	private	houses	by burial.					
Thrown into sea									
* Otherwise dealt with									

* State mode of disposal.

11. AVERAGE DAILY NUMBER OF CARTLOADS OF TIN CANS, BOTTLES, BROKEN CROCKERY AND OTHER INCOMBUSTIBLE MATERIAL REMOVED FROM HOUSES, HUTS, AND COMPOUNDS

1910.	1911.	1912.
Nil	"	"

12. WATER SUPPLY.

Nature of Water Supply	1910.	1911.	1912.
Pipe-borne water :— Source (river, lake, or spring) :— Number of linear yards Number of stand-pipes along roads Number of stand-pipes in compounds and houses	Water obtained from stream, where a water posted who carriers.	from mountain guard is signs books of water	
Wells :— Public :— Number Number with pumps protected against surface water and mosquito-protected			
Private :— Number Number protected against surface water and mosquito protected			
Tanks :— Public :— Number underground Number mosquito-protected and served by pumps Number above ground Number mosquito-protected Number of 400 gallons capacity or less Number above 400 gallons			
Private :— Number underground Number mosquito protected Number above ground Number mosquito protected Number of 400 gallons capacity or less Number above 400 gallons			
Nature of Tanks :— Wood Iron Concrete			
Barrels :— Number Number mosquito protected			

13. DRAINAGE.

Nature of drainage.	Public.	Private.
Masonry drains :—		
Lineal yards of masonry drains :—		
1910	46 chains	Nil.
1911		
1912		
Lineal yards recons tructed during the year :—		
1910		
1911		
1912		
Lineal yards repaired during the year :—		
1910		
1911		
1912		
Lineal yards of new drains constructed during the year :—		
1910		
1911		
1912		
Earth drains or ditches :—		
Number of linear yards of ditches cleaned :—	No accurate record	
1910		
1911		
1912		
Number of linear yards of dithes dug and graded :—		
1910		
1911		
1912		
Average frequency of clearing ditches of grass :—	Cleared periodically.	
1910		
1911		
1912		

14. CLEARANCE OF UNDERGROWTH LONG GRASS, AND JUNGLE.

	1910	1911.	1912
Number of square yards of weeds, grass, and vegetation out and removed	Several times during the year.		
Average frequency of clearance of rank vegetation on same area ...			

15. EXCAVATIONS AND LOW-LYING LAND.

	1910	1911	1912
Number of pools and excavations	Nil	Nil	Nil
Number of excavations filled up	"	"	"
Amount of low-lying and march land raised and drained	"	"	"
Number of pools, marshes, &c. fish-stocked	"	"	"
Number of cubic yards of material used for filling up pools and excavations	"	"	"
Number of persons fined for making new excavations	"	"	"
Average number of men daily employed in filling up pools &c	"	"	"

16. OILING.

	1910	1911	1912
Number of drains oiled
Number of pools and excavations oiled
Number of tanks and barrels oiled
Average number of men daily employed for oiling drains, pools, and watertanks of barrels

17. INSPECTIONS AND PROSECUTIONS.

	1910	1911	1912
Number of inspectors employed	Native Inspector and Medical Officer (M. O. H.)		
Number of houses inspected			
Number of houses where larvae were found			
Number of notices served to remove conditions causing the breeding of larvae		—	—
Number of persons fined for having mosquito larvae on premises ...		—	—
Number of notices served to remove insanitary conditions on premises ...		—	14 Europ'ns. 2 Indians.
Number of persons fined for not removing insanitary conditions after notice			
Number of soda and aerated water factories inspected	—	1	1

TABLE IV.

SUMMARY OF ROUTINE SANITARY WORK DONE DURING THE YEAR IN THE TOWN.

1. NAME OF TOWN—FORT JOHNSTON.

	Approximate area.	Number of proclaimed open spaces.
1910	44 acres.	Nil.
1911	"	"
1912	"	"

2. POPULATION.

	Number of Natives.		Number of Europeans.		Total.
	Males.	Females.	Males	Females.	
1910	No natives in Township except personal servants and prisoners. 12	Towship Asiatics. Males.	15	2	17
1911			15	1	16
1912			15	6	21

3. HOUSING.

	Number occupied by Europeans.	Number occupied by Natives.
Number of Houses :—		
1910	12	Nil
1911	12	"
1912	12	"
Number of Huts :—		
1910	Nil	
1911	"	
1912	"	

4. MOSQUITO PROTECTION OF HOUSES.

	1910	1911.	1912.
Number of European houses wholly mosquito-protected	Nil.	Nil.	Nil.
Number of European houses with mosquito room	8	8	8
Number rendered during the year wholly mosquito-protected	Nil.	Nil.	Nil.
Number rendered during the year partially mosquito-protected	4	"	1

5. ERECTION OF NEW BUILDINGS DURING THE YEAR.

	1910.	1911.	1912.
Number of public buildings erected with sanction as to site, construction, and relation to other buildings.	Nil.	Nil.	Nil.
Number of houses erected with sanction as to site, construction and relation to other buildings.
Number of huts erected with sanction as to site, construction, and relation to other buildings.
Number of houses built without sanction
Number of huts built without sanction

ACTION TAKEN.

	Number of Prosecutions.		Number demolished.	
	Huts.	Houses	Huts.	Houses.
1910	Nil.		Nil	
1911	"		"	
1912	"		"	

6. MARKETS.

	Total number.	Number paved and drained.	Number unpaved.
1910	1	Nil.	1
1911	1	...	1
1912	1	...	1

7. SLAUGHTER HOUSES.

	Total number.	Number paved and drained.	Number unpaved.
1910	Nil.	Nil.	Nil.
1911 ... ..	...	...	...
1912 ... ..	...	...	...

8. LATRINES.

	For Males.		For Females.	
	Number.	Number of seats.	Number.	Number of seats.
Number of Public Latrines :—				
1910	2 Public Latrines, 1 males, 1 females.			
1911				
1912				
Number of new Public Latrines erected during the year :—				
1910	Nil	Nil	Nil	Nil
1911				
1912				
Number of Public Latrines repaired during the year :—				
1910 ... ..	...	...	...	...
1911 ... ..	...	...	...	...
1912 ... ..	...	...	...	...
Number of Public Latrines demolished during the year .—				
1910 ... ..	...	...	...	...
1911 ... ..	...	...	...	...
1912 ... ..	...	...	...	...

8. LATRINES.—Continued.

	1910.	1911.	1912.
Number of Private Latrines	12	12	12
Average number of pails of nightsoil removed daily...	Pail system.	Removed daily.	
Average number of soiled pails removed and clean pails substituted ...	...	...	...
Number of nightsoil men employed to clean latrines and remove excreta	...	...	...
Number of cesspools ... ..	...	...	...
Number of cesspools cleansed ... ..	...	...	...
Number of new cesspools constructed during the year ... ..	...	...	...
Number of old cesspools abolished ... ..	...	...	...
Number of cesspools oiled regularly by Department ... ..	...	...	...

9. REMOVAL OF REFUSE.

	1910.	1911.	1912
Number of dustbins	Refuse removed daily in or baskets.		boxes
Number of carts at work daily to remove refuse from sreetes ... ..			...
Amount of refuse removed daily ... ..		...	...
Number of carts at work daily to remove refuse from yards and premises		...	...
Amount of refuse removed daily from yards and premises ... ..		...	...
Number of men employed for moving refuse ... ..	...	...	...

10. MODE OF DISPOSAL OF EXCRETA, REFUSE, AND OFFAL.

	Daily average number of pails of excreta.			Daily average number of cartloads of refuse.			Daily average number of cartloads of Slaughter House and Market Offal.		
	1910.	1911.	1912.	1910.	1911.	1912.	1910.	1911.	1912.
Buried or trenched	Buried	Buried	Buried	Nil	Nil	Nil	Nil	Nil	Nil
Burnt ... ..	...	...	...	...	...	...	...	...	...
Thrown into sea ... ..	...	...	...	...	...	...	...	...	...
* Otherwise dealt with ... ..	..	...	...	...	...	...	...	...	...

* State mode of Disposal.

11. AVERAGE DAILY NUMBER OF CARTLOADS OF TIN CANS, BOTTLES, BROKEN CROCKERY,
AND OTHER INCOMBUSTIBLE MATERIAL REMOVED FROM HOUSES, HUTS AND COMPOUNDS

1910.	1911.	1912.
Nil.	Ditto.	Ditto.

12. WATER SUPPLY.

Nature of Water Supply.	1910.	1911.	1912.
Pipe-borne water :—			
Source (river, lake, or spring) :—			
Number of linear yards	Nil.	Nil.	Nil.
Number of stand-pipes along roads			
Number of stand-pipes in compounds and houses			
Wells :—			
Public :—			
Number	"	"	"
Number with pumps protected against surface water and mosquito-protected			
Private :—			
Number	3	3	3
Number protected against surface and mosquito protected			
Tanks :—			
Public :—			
Number underground			
Number mosquito-protected and served by pumps			
Number above ground			
Number mosquito-protected			
Number of 400 gallons capacity or less			
Number above 400 gallons			
Private :—			
Number underground	"	"	"
Number mosquito-protected			
Number above ground			
Number mosquito-protected			
Number of 400 gallons capacity or less			
Number above 400 gallons			
Nature of Tanks :—			
Wood	"	"	"
Iron			
Concrete			
Barrels :—			
Number		"	"
Number mosquito-protected			

13. DRAINAGE.

Nature of drainage.	Public.	Private.
Masonry drains :—		
Lineal yards of masonry drains :—		
1910	Brick gutters along	sides of roads
1911		
1912		
Lineal yards reconstructed during the year :—		
1910	"	"
1911		
1912		
Lineal yards repaired during the year :—		
1910	"	"
1911		
1912		
Lineal yards of new drains constructed during the year :—		
1910	"	"
1911		
1912		
Earth drains or ditches :—		
Number of linear yards of ditches cleaned :—		
1910	"	"
1911		
1912		
Number of linear yards of ditches dug and graded :—		
1910	"	"
1911		
1912		
Average frequency of clearing ditches of grass :—		
1910	"	"
1911		
1912		

14. CLEARANCE OF UNDERGROWTH LONG GRASS, AND JUNGLE.

	1910.	1911.	1912.
Number of square yards of weeds, grass, and vegetation cut and removed	Not estimated.	Not estimated.	Not estimated.
Average frequency of clearance of rank vegetation on same area ...	Periodically.	Periodically.	Periodically.

15. EXCAVATIONS AND LOW-LYING LAND.

	1910.	1911.	1912.
Number of pools and excavations	Nil	Nil	Nil
Number of excavations filled up	"	"	"
Amount of low-lying and marsh land raised and drained	"	"	"
Number of pools, marshes, &c. fish-stocked	"	"	"
Number of cubic yards of material used for filling up pools and excavation	"	"	"
Number of persons fined for making new excavations	"	"	"
Average number of men daily employed in filling up pools, &c.	"	"	"

16. OILING.

	1910.	1911.	1912.
Number of drains oiled	Nil.	Nil.	Nil.
Number of pools and excavations oiled	"	"	"
Number of tanks and barrels oiled	"	"	"
Average number of men daily employed for oiling drains, pools, and watertanks or barrels	"	"	"

17. INSPECTIONS AND PROSECUTIONS.

	1910.	1911.	1912.
Number of inspectors employed	Periodical inspection by the Medical Officer of Township.		
Number of houses inspected			
Number of houses where larvae were found			
Number of notices served to remove conditions causing the breeding of larvae			
Number of persons fined for having mosquito larvae on premises			
Number of notices served to remove insanitary conditions on premises			
Number of persons fined for not removing insanitary conditions after notice			
Number of soda and aerated water factories inspected			

TABLE V.
Meteorological Return for the Year 1911

Month	Temperature					Rainfall		Winds		Remarks.
	Solar Maximum.	Minimum on Grass.	Shade Minimum.	Range.	Mean.	Amount in Inches.	Degree of Humidity.	General Direction.	Average Force.	
January.	116	61·6	61	22·5	71·3	10·77	84	E	1·4	
February.	122	60·7	59	25·0	71·0	13·41	84	E	·8	
March.	127	60·0	56	27·0	69·8	6·13	82	E	·8	
April.	129	55·8	55	25·6	68·0	3·97	77	E	1·5	
May.	121	53·6	48	30	64·6	4·50	83	E	·9	
June.	115	46·3	45	30	59·8	1·20	79	E	·9	
July.	115	46·9	46·2	28·2	60·4	·21	77	E	1·0	
August.	128	49·9	47	31	62·8	·36	73	E	1·5	
September.	139	52·7	48	39	67·4	·19	61	E	1·8	
October.	143	59·2	60	30·8	73·9	1·70	60	E	1·7	
November.	140	60·0	59	32·4	74·3	4·00	68	E	1·4	
December.	146	60·6	60	29·6	73·4	10·45	81	E	·8	
Year's means	111	55·6	53·6		68·0	56·89	75		1·2	

V. HOSPITALS AND DISPENSARIES.

It is necessary in this place to draw attention to the circumstance that the medical staff of the Protectorate has hitherto been so limited as not to have admitted of any routine medical work being done in the Lake districts, which comprise so large a portion of the Protectorate. The representations recently made by his Excellency the Governor have resulted in the appointment of two additional Medical Officers, which now brings the total of the staff up to eleven. It should be pointed out, however, that two or three Medical Officers are normally on furlough, thus leaving a balance of about eight or nine available for duty. Medical Officers up to the present have been permanently stationed in but four districts, but it will now be possible to make provision for the Lake districts also.

There are Government Hospitals and Dispensaries at the undernoted stations, and lists of the cases treated at these institutions are appended.

Port Herald. A Medical Officer, hitherto stationed at Chiromo, is now resident at this station. A permanent brick building to serve as a Dispensary will shortly need to be built here, the out-patient work at present being carried on in a temporary structure. Also, should developments in connection with railway extension result in any large increase of the native population, an addition to the Dispensary will be needed, in order to provide accommodation for those who cannot be treated as out-patients.

Chiromo. There is a Dispensary at this station in charge of a native, and is visited from time to time by the Medical Officer of Port Herald.

Blantyre. At this station there is a European Hospital, a Dispensary for native out-patients, and a small native hospital which is utilized mainly for the treatment of sick prisoners. Medical work among natives in the Blantyre district is carried on by the Church of Scotland Mission, and the Government contribute for the support of two beds in their native hospital, which is relatively speaking a large and well-found institution.

Zomba. There is a European Hospital here, a Hospital for Indian and Native Troops, a Hospital for sick prisoners and lunatics, and a Dispensary for native out-patients. The Government also continue to administer and to work a Native Hospital here, which is the property of the Church of Scotland Mission. There is also the Central Lunatic Asylum at Zomba, an institution on which so many calls are now made that it is proposed to increase the accommodation for inmates.

Fort Johnston. Owing to the large decrease within recent years of the European population at this station, the European Hospital does not receive many patients. There is also a Native hospital here, and a Dispensary for native out-patients.

Karonga. At this station there is a Dispensary for native out-patients, but a Medical Officer is not often continuously resident here.

It may here be pointed out that a considerable amount of medical work is done among natives, and to a lesser degree among Europeans, by the various missionary societies. Under the heading, Charitable Institutions, the Nyasaland Blue Book furnishes returns of the medical work done by the several missions.

PORT HERALD. EUROPEANS (Treated at their own homes).

Malaria	...	..	.	...	...	7
Appendicitis	...	...	..	...	...	1
Pleurisy	...	...	...	...	...	1
Lumbago	...	...	...	...	...	1
Total						10

PORT HERALD. DISPENSARY OUT-PATIENTS.

Diseases.	Europeans.	Asiatics.	Natives.	Deaths.	Total.
Small-pox	...		25	7	25
Whooping Cough	...		8		8
Mumps	...		9		9
Pneumonia	...	1	21	1	22
Dysentery	...		100	1	100
Malaria	...				
(a) Intermittent	7		96		103
(b) Pernicious	2				2
Erysipelas	1				1
Phthisis	...		1		1
Leprosy (mixed)	...		53		53
Yaws	...		1		1
Syphilis	...				
(a) Primary	...		1		1
(b) Secondary	1		9		10
(c) Tertiary	1				1
Gonorrhoea	2				2
Rheumatism	...		39		39
New Growth (non-malignant)	...		1		1
do. (malignant)	...		2		2
LOCAL DISEASES.	...				
Nervous System	...				
Functional	...		1		1
Epilepsy	1		29		30
Neuralgia	...				
MENTAL.	...				
Delusional Insanity	...		1		1
Diseases of Eye.	...				
Cat. Conjunctivitis	...		18		18
Pur. "	...		2		2
Dacryocystitis	...		1		1
Cataract	...		1		1
Diseases of Ear.	...				
Otalgia	...		3		3
Chr. Otitis Media	...		40		40
Diseases of Circulatory System	...				
Aneurysm R. C. Carotid	...		1		1
Diseases of Respiratory System	1	1	162		164
Bronchial Catarrh	1		2		3
Pleurodynia	1		15	1	16
Pleurisy	...		1		1
Asthma	1		1		2
Other Diseases	...				
Digestive System	1				1
Dyspepsia	...		1		1
Gastric Ulcer	1				1
Appendicitis	1		31		32
Dental Caries	...		263		263
Other Conditions	...				
Lymph: System.	...	1	1		2
Adenitis	...				
Urinary System.	...		1		1
Bilharzia	...				
Generative System.	...		1		1
Phimosis	...				1
Prostatitis	1				
Orgs: Locomotion.	...		17		17
Synovitis	1		11		12
Lumbago	...				
Dis: Cellular Tissue.	1	1	4		6
Abscess	...				
Dis: of Skin.	...		1		1
(a) Urticaria	...		648		648
(b) Ulcers	...		1		1
(c) Tinea Imbricata	...		40		40
(d) Scabies	...		4	2	4
Multiple Wounds	...				
Fractures	...		2		2
Clavicle	...		1		1
Humerus	...		1		1
Lower Jaw	...		1		1
Femur	...		1		1
Tibio-Fib. Comp.	...		56		56
Other Injuries	...				
Surgical Operations	...				
(a) Minor	...		6		7
Dental Extract:	1		4		6
Abscess	1	1	1		1
Cataract	...				
(b) Major	...				
Amputations	...				

PORT HERALD. DISPENSARY OUT-PATIENTS.—(Continued).

BLANTYRE EUROPEAN HOSPITAL.

Diseases.	In Hospital end of 1911 31/3/11.	Yearly adms.	Total Deaths.	Total cases.	In Hospital end of 1912 13/3/12.
General.					
Pneumonia ...	Nil.	1	Nil.	1	Nil.
Dysentery ..	"	2	"	2	"
Malaria ...	1	24	"	25	"
Blackwater ...	Nil.	2	1	2	"
Delirium Tr. ...	"	1	Nil.	1	"
Local.					
Nervous System.					
Neurasthenia ...	"	1	"	1	"
Circulatory.					
Haemorrhoids ...	"	1	"	1	"
Digestive.					
Constipation ...	"	1	"	1	"
Dyspepsia ...	"	1	"	1	"
Appendicitis ...	"	1	"	1	"
Liver Abscess ...	"	1	1	1	"
Lymphatic.					
Parotitis					
seq. Blackwater ...	"	1	Nil.	1	"
Bubo ...	"	2	"	2	"
Urinary.					
Bacilluria ...	"	1	"	1	"
Cellular.					
Cellulitis ...	"	1	"	1	"
Mastitis ...	"	1	"	1	1
Injuries					
Fract. Tibia ...	1	Nil.	"	1	Nil.
Minor ...	Nil.	3	"	3	"
Operations.					
Minor ...	"	1	"	1	1
Major.					
L. Abscess ...	"	1	1	1	Nil.
Obstetrics.					
Acchts. ...	"	4	Nil.	4	"
Abortion ...	"	1	"	1	"
Totals ...	2	52	2	54	2

EUROPEAN CASES TREATED AS OUT-PATIENTS, OR AT RESIDENCE.

Station Blantyre. Period, Year ended March 31st 1912.

Diseases.	Remaining under treat- ment 31/3/11.	Yearly admsns.	Total Deaths.	Total cases treated.	Remaining under treat- ment 31/3/12.
General.					
Pneumonia	Nil.	1	Nil.	1	Nil.
Dysentery	"	2	"	2	"
Malaria	"	17	"	17	"
Blackwater	"	1	"	1	"
Syphilis	3	7	"	10	"
Gonorrhoea	1	10	"	12	1
Rheumatism	Nil.	4	"	4	Nil.
Septicaemia	"	1	"	1	"
Diphtheria	"	1	"	1	"
Other diseases	"	2	"	1	"
Local.					
Eye.					
Conjunctivitis	"	1	"	1	"
Ear.					
Cerumen impact	"	2	"	2	"
Respiratory.					
Bronchitis	"	4	"	4	"
Nervous System.					
Chorea	"	1	"	1	"
Digestive.					
Constipation	"	3	"	3	"
Diarrhoea	"	7	"	7	"
Dyspepsia	"	6	"	6	"
Ing. Hernia	"	1	"	1	"
Generative.					
Varicocele	"	1	"	1	"
Skin.					
Eczema	"	1	"	1	"
Seborrhoea	"	1	"	1	"
Injuries.					
Disloc. Semilunar Cart	"	1	"	1	"
Comp. disloc. Phalanx.	"	1	"	1	"
Various	"	19	"	19	"
Total	4	90	0	94	1

BLANTYRE NATIVE HOSPITAL.

Diseases.	In Hospital end of 1911. 31-3-11.	Yearly admsns.	Total Deaths.	Total cases.	In Hospital end of 1912. 31/3/12.
Pneumonia ...	Nil	6	Nil	6	Nil
Dysentery ...	"	29	1	29	2
Syphilis ...	"	1	1	1	Nil
Malaria ...	"	1	1	1	"
Chicken-pox ...	"	3	1	3	"
Local. ...					
Nervous System. ...					
Epileptiform insanity ...	"	1	Nil	1	"
Ear. ...					
Otitis Media ...	"	3	"	3	"
Respiratory. ...					
Bronchitis ...	"	3	1	3	"
Pleurisy ...	"	1	Nil	1	"
Asthma ...	"	1	"	1	"
Digestive. ...					
Diarrhoea ...	"	19	1	19	"
Constipation ...	"	8	Nil	8	"
Lymphatic. ...					
Tonsilitis ...	"	2	"	2	"
Hodgkins disease ...	"	1	"	1	"
Skin. ...					
Eczema ...	"	2	"	2	"
Furunculosis ...	"	1	"	1	"
Injuries. ...					
Minor injuries ...	"	25	"	25	"
Animal Parasites, ...					
Ankylostomiasis ...	"	1	1	1	"
Totals	0	108	7	108	2

BLANTYRE NATIVE OUT-PATIENTS.

Diseases.	Under treat- ment end of 1911 31-3-11.	Yearly Admns.	Total Deaths.	Total cases.	Under treat- ment end of 1912 31/3/12.
General.					
Pneumonia	Nil	7	Nil	7	Nil
Dysentery	"	19	"	19	"
Leprosy	"	1	"	1	"
Gonorrhoea	"	1	"	1	"
Syphilis	"	12	"	12	"
Malaria	"	8	"	8	"
Rheumatism-	"	3	"	3	"
Local.					
Nervous System.					
Headache	"	51	"	51	"
Migraine	"	1	"	1	"
Epilepsy	"	1	"	1	"
Eye.					
Conjunctivitis	"	26	"	26	"
Ear.					
Cerumen impact.	"	4	"	4	"
Otitis	"	5	"	5	"
Circulatory.					
Morbus Cordis.	"	1	"	1	"
Respiratory.					
Bronchitis	"	32	"	32	"
Pleurisy	"	2	"	2	"
Cough	"	21	"	21	"
Digestive.					
Diarrhoea	"	57	"	57	"
Dyspepsia	"	9	"	9	"
Constipation	"	28	"	28	"
Stomatitis	"	1	"	1	"
Pyorrhoea Alv.	"	3	"	3	"
Other diseases	"	6	"	6	"
Skin.					
Urticaria	"	1	"	1	"
Eczema	"	12	"	12	"
Scabies	"	7	"	7	"
Impetigo	"	3	"	3	"
Minor injuries	"	86	"	86	"
Burns	"	6	"	6	"
Poisons.					
Insect bite	"	1	"	1	"
Animal Parasites					
Intestinal.					
Ankylostomiasis	"	1	"	1	"
Tricocephalus	"	1	"	1	"
Urinary.					
Bilharzia	"	1	"	1	"
Dental: extractions	"	11	"	11	"
Obstetrics.					
Accouchements	"	3	"	3	"
	0	432	0	432	0

REGISTER OF EUROPEAN PATIENTS, ZOMBA.

Disease.	Admitted to hospital.	Not admitted to hospital.	Total.
Measles	1	1	2
Varicella		2	2
Diphtheria		2	2
Influenza		1	1
Dysentery		3	3
Enteric Fever	1		1
Malaria	2	32	34
Debility		2	2
Malnutrition		1	1
Gout		1	1
Gonorrhoea		4	4
Epilepsy		2	2
Neurasthenia		3	3
Migraine		3	3
Neuralgia		3	3
Mania a potu	1		1
Exophthalmic Goitre	1		1
Tinnitus aurium		2	2
Deafness		1	1
Otitis media		2	2
Conjunctivitis		1	1
Astigmatism		1	1
Nasal Catarrh		13	13
Laryngeal catarrh		1	1
Bronchitis	1	16	17
Dental Caries		5	5
Dental Periostitis		2	2
Glossitis		1	1
Tonsillitis		3	3
Pharyngitis		16	16
Aesophagus, bone impacted in		1	1
Gastric catarrh		14	15
Intestinal catarrh Diarrhoea	1	9	9
Hepatitis	1		1
Cholecystitis		1	1
Appendicitis		1	1
Confinements	7		7
Tubal Abortion	1		1
Endometritis		1	1
Mastitis		1	1
Cystitis		1	1
Retention of urine	1		1
Album nuria		1	1
Lumbago		1	1
Urticaria		2	2
Erythema		4	4
Sudamina		1	1
Sebaceous Cyst		1	1
Furuncle		3	3
Ulcer		7	7
Bee-sting		1	1
Ptomaine poisoning		4	4
Iodine Poisoning		1	1
Injuries			
Burns		1	1
Contusions		2	2
Haematoma		1	1
Superficial wounds		8	8
Minor injuries		8	8
Sprains		2	2
Injuries to knee		2	2
Cartilages		3	3
Dislocations		1	1
Fractures		1	1
Synovitis		1	1
Parasites			
Dermatophilus penetrans		4	4
Cordylobiasis		4	4
Intestinal Helminths		2	2
Bilharziosis		1	1

Among these cases there was one death, an infant, from Enteritis.

REGISTER OF PATIENTS TREATED AT THE NATIVE HOSPITAL, ZOMBA.

Disease,	Out-patients.	In-Patients.	Total.
Measles	...	2	2
Varicella	11	8	19
Diphtheria	(1 death)	4	4
Parotitis	1	1	2
Dysentery	84 (3 deaths)	14	98
Malaria	108	16	124
Gonorrhoea	9	7	16
Syphilis	11	6	17
Yaws	2		2
Beri-beri		2	2
Scurvy	3	1	4
Pellagra	2		2
Rheumatism	82	4	86
Debility	3	3	6
Headache	98	2	100
Insanity			
Mania		1	1
Stupor		1	1
Delusional		1	1
Melancholia		2	2
Neuritis	1		1
Neuralgia	3		3
Torticollis	1		1
Paralysis		1	1
Contusion of eye	1		1
Conjunctivitis	80	2	82
Iritis	8		8
Cataract		2	2
Wax in ear	5		5
Otorrhoea	68		68
Otalgia	5		5
Nasal Catarrh	27		27
Laryngitis	2	1	3
Bronchitis	304 (1 death)	8	312
Pleurisy		6	6
Pneumonia	8 (1 death)	10	18
Asthma	1		1
Dental Caries	166	1	167
Alveolar abscess	9	1	10
Tonsilitis	3		3
Pharyngitis	13		13
Dyspepsia	13	4	17
Constipation	266	6	232
Diarrhoea	135	4	139
Colic	91		91
Hepatitis	1	1	2
Fissure in ano	1		1
Miscarriage	(1 death)	1	1
Leucoderma	1		1
Dermatitis	7		7
Urticaria	1		1
Eczema	58		58
Acne	1	1	2
Herpes	5		5
Impetigo	4		4
Tinea	11		11
Adenitis	5	1	5
Synovitis	2		2
Sebaceous Cyst	1		1
Whitlow	22	6	28
Boil	20	1	21
Ulcer	647	53	700
Unjuries			
Burns	29	3	32
Abrasions	109	6	115
Superficial wounds	220	6	226
Deep	1	18	19
Fissures in foot	41		41
Sprains	20	1	21
Fractures	(1 death)	6	6
Wasp-sting	1		1
Snake-bites	2	1	3
Animal bites	6	1	7
Parasites			
Bilharziosis	2		2
Thread-worm	1		1
Scabies	167	4	171
Dermatophiliasis	17	1	18
Amputation of finger		1	1
Amputation of leg		1	1
Major operations			11
Minor operations			229

CENTRAL LUNATIC ASYLUM, ZOMBA.

Mania	...	...	...	10
Melancholia	...	...	...	1
Delusional	...	...	...	3
Dementia	...	...	...	1
General Paralysis of the	...	...	...	...
Insane?	...	...	...	1
Epileptic Insanity	...	...	...	1

RETURN OF SICK FOR THE YEAR 1911-12, CAMP, ZOMBA.

Name of Diseases.	Indians.	Native Troops.	Prisoners.	General Population.	Remarks.
Beri Beri	...	2	4	1	
Chicken-pox	...	8	14	6	
Debility	4	2	7	...	1 death prisoner. 2 deaths prisoners.
Dysentery	14	3	7	8	
Gonorrhoea	...	1	1	2	
Leprosy Nodular	...	2	...	...
Malaria Subtertian	76	48	42	45	
„ Febricula	222	11	4	4	
Measles	1	...	...	1	
Parotitis (epidemic)	1	...	1	...	
Pellagra	...	...	18	...	3 deaths prisoners. 3 deaths 1 native troops. 2 gen. pop.
Pneumonia	...	14	5	4	
Syphilis Primary	...	...	...	1	
„ Secondary	...	3	2	11	
Tuberculosis	1	1	...	...
Whooping Cough	...	...	...	1	
Yaws	...	...	2	...	
Diabetes	...	...	1	...	
Scurvy	1	...	...	...
Tumour of Brain	1	...	...	...
Epilpsy	...	...	1	...	
Neuralgia	10	6	8	4	
Blepharitis	1	...	4	...	
Conjunctivitis	8	25	13	73	
Keratitis Ulcerative	...	1	...	1	
Iritis	...	1	1	1	
Otitis Media	3	13	16	18	
Nasal Catarrh	64	2	5	1	
Valvular Disease of Heart, mitral	1	1	1	1	
Syncope	1	8	4	...	
Laryngitis	...	1	1	...	1 death general population.
Bronchitis	69	63	130	97	
Asthma	3	1	...	...
Pleurisy	2	2	2	8	
Stomatitis	28	3	6	5	
Caries of teeth	12	16	11	39	
Pharyngitis	16	4	3	...	
Tonsillitis	5	1	...	1	
Gastritis	...	1	...	...
Dyspepsia	121	9	4	5	
Hernia	...	1	1	...	1 deaths prisoners.
Diarrhoea	12	15	23	30	
Constipation	68	21	30	47	
Colic	21	16	21	40	
Ascites	...	...	1	...	1 death Native Troops.
Adenitis	2	1	3	6	
Cystitis	...	1	...	...
Bilharziosis	...	...	3	1	
Soft chancre	...	1	...	...
Phymosis	...	1	...	...
Orchitis	...	2	1	...	
Endometritis	...	...	...	2	
Osteitis	...	...	1	...	
Arthritis	1	...	1	...	
Teno-Synovitis	1	...	...	...
Muscular Rheumatism and Fibromyositis	32	24	49	34	
<i>Carried forward</i>	802	336	452	488	

RETURN OF SICK FOR THE YEAR 1911-12, CAMP, ZOMBA.—*Continued*

Name of Diseases.		Indians.	Native Troops.	Prisoers.	General Population.	Remarks.
<i>Brought forward</i> ...		802	336	452	488	
Cellulitis	...	2	6	16	5	
Abscess	...	2	7	7	4	
Urticaria	...	1	1	...	...
Eczema	...	1	2	4	12	
Boil	...	12	5	3	2	
Onychia	...	1	2	...	...
Herpes	...	1	...	2	2	
Impetigo	...	...	...	...	2	
Ulcers	...	17	11	20	49	
Tinea	...	9	14	2	5	
Scabies	...	1	14	5	33	
Acne	...	...	1	...	...
Folliculitis	...	...	...	10	...	
Papillomata swarts	...	2	...	...	2	
Local Injurie	...	220	441	449	395	
Surgical Operations	...	7	17	13	34	
Poisons	...	...	...	4	...	
Myiasis	...	5	...	...	...
Jigger Dermatophilus penetrans	...	16	1	2	1	
Total		1099	863	989	1035	

FORT MANGOCHÉ. NATIVE TROOPS
AND FOLLOWERS.

General Diseases.	Admis- sions.	
Malaria	18	
Debility	3	
Dysentery	5	
Syphilis	2	
Scurvy	1	
Rheumatism	44	
Chicken—pox	4	
Gonorrhoea	2	
Measles	1	
Mumps	1	
Nervous System.		
Headache	36	
Neuralgia	8	
Syncope	3	
Hysteria	1	
Eye.		
Conjunctivitis	39	
Stye	1	
Ear.		
Otorrhoea	15	
Foreign body in ear	3	
Respiratory System.		
Bronchitis	70	
Asthma	1	
Pneumonia	2	
Disestive System.		
Gumboil	2	
Caries of tooth	25	
Constipation	23	
Colic	30	
Indigestion	7	
Diarrhoea	22	
Stomatitis	3	
Connective Tissues.		
Abscess	6	
Synovitis	6	
Skin.		
Scabies	53	
Fissure of foot	164	
Ringworm	27	
Eczema	5	
Boil	6	
Prurigo	1	
Herpes	1	
Abrasions	20	
Ulcers	23	
Injuries.		
Burn	7	
Wound	262	
Sprain	12	
Contusion	14	
Fracture	2	
Dislocation	1	
Tinea	1	
Sycosis	1	
Animal Parasites.		
Tape worm	1	
Bilharzia	2	
Operations.		
Minor	25	

FORT JOHNSTON. NATIVE DISPENSARY
(OUTPATIENTS)

Diseases.	No. of cases treated.	Deaths.
General Diseases.		
Malaria	47	
Syphilis	3	
Gonorrhoea	3	
Debility	6	
Diseases of Respira- tory System.		
Pleurisy	...	
Bronchitis	46	
Diseases of Digestive System.		
Stomatitis	1	
Dental Caries	34	
Pharyngitis	1	
Dyspepsia	9	
Colic	9	
Dysentery	8	
Diarrhoea	32	
Constipation	161	
Dental Cyst	1	
Strang. Ing. Hernia	1	
Diseases of the Eye.		
Catarrhal Conjunc- tivitis	13	
Blepharitis	1	
Diseases of the Ear.		
Wax in Ext. Meatus	2	
Otitis Media	11	
Diseases of the Skin.		
Eczema	3	
Scabies	137	
Herpes	1	
Injuries, Wounds etc.		
Wounds	287	
Burns	2	
Sprains	5	
Ulcers and Abscesses.		
Abscess	10	
Ulcer	131	
Diseases of Muscle.		
Lumbago	1	
Muscular Rheuma- tism	34	
Mental Disease.		
Suicidal Mania	1	
Diseases of Central Nervous System.		
Headache	8	
Primary Lateral Sclerosis	1	

Nil

FORT JOHNSTON. NATIVE HOSPITAL (IN-PATIENTS).

Diseases.	Remain- ing at end of 1911.	Admis- sions.	Deaths.	Total Treated.	Remain- ing at end of 1912	Remarks.
General Diseases. ...		1	1	1	—	Patient an Asiatic.
Blackwater Fever ...		1	—	1	—	
Malaria ...		3	1	3	—	
Yaws ...		1	—	1	—	
Syphilis ...		1	—	1	1	
Gonorrhoea ...		2	1	2	—	Patient an Asiatic.
Beriberi ...		3	—	3	—	
Chicken-pox ...		1	—	1	—	
Measles ...		1	1	1	—	
Fever (undiagnosed) ...						
Diseases of Respiratory System :—		1	—	1	—	
Pneumonia ...		2	—	2	—	
Pleurisy ...						
Diseases of Digestive System :—		1	—	1	—	
Dysentery ...		1	—	1	—	
Diarrhoea ...		1	—	1	—	
Colic ...		1	1	1	—	
Liver Abscess ...						
Disease of Eye :—		1	—	1	—	Patient an Asiatic.
Gonorrhoeal Ophthalmia ...						
Diseases of Genito-urinary System :—		1	—	1	—	
Bright's disease ...		1	—	1	—	
Urethral Fistula ...						
Wounds, Injuries etc :—		1	—	1	1	
Scalp wound ...		1	—	1	—	
Wound of cheek ...		1	—	1	—	
“ “ Finger ...		1	—	1	—	
Traumatic Synovitis (knee) ...		1	—	1	—	
Gunshot Wound ...		1	—	1	1	
Co. Fract. of tibia ...		1	—	1	1	
Spinal Concussion ...						
Ulcers, Abscess etc :—		1	—	1	—	
Abscess of foot ...		1	—	1	—	Patient an Asiatic.
Ulcer of leg ...						
Tumours.		1	—	1	—	
Tumour of foot ...		1	—	1	1	
“ “ Lower Jaw ...		1	—	1	1	
“ “ Neck ...						

FORT JOHNSTON. NATIVE HOSPITAL
(IN-PATIENTS).

Year ending March 31st 1912.

OPERATIONS UNDER GENERAL
ANAESTHETIC :—

Amputation of finger	...	...	...	...	1
" " leg	...	...	...	...	1
Excision of tumour of foot	...	...	...	...	1
" " neck	...	...	...	...	1
" " lower jaw	...	...	...	...	1
Perineal section	...	...	...	...	2
					<hr/>
					Total 7

FORT JOHNSTON. EUROPEAN HOSPITAL (INPATIENTS).

Diseases.	Remain- ing in Hospital end of 1911	Yearly Total.		Total cases treated.	Remain- ing in Hospital end of 1912.	Remarks.
		Admis- sions.	Deaths.			
Malaria	—	1	—	1	—	
Blackwater Fever	—	1	—	1	—	
Total	—	2	—	2	—	

EUROPEAN CASES TREATED AT DISPENSARY OR AT THEIR OWN HOUSES.
(OUT-PATIENTS).

Disease.								Number of cases treated.	
Malaria	...	...	...	...	...	...	...	6	
Gout	...	...	...	...	...	...	...	1	
Gonorrhoea	...	...	...	...	...	...	...	1	
Dental Caries	...	...	...	...	...	...	...	2	
Colic	...	...	...	...	...	...	...	1	
Diarrhoea	...	...	...	...	...	...	...	4	
Haemorrhoids	...	...	...	...	...	...	...	1	
Bronchitis	...	...	...	...	...	...	...	1	

Total 17 Deaths. Nil.

VI. *Scientific.* The following report on Trypanosomiasis has been submitted by Dr. G. M. Sanderson, the Medical Officer in charge of Sleeping Sickness Investigations in the Dowa Sub-district of Central Angoniland, during the year under review.

Aetiology. The trypanosome is morphologically indistinguishable from *T. gambiense*: dimorphism is marked. Stannus has obtained by sub-inoculation, trypanosomes resembling the *T. rhodesiense* of Stevens and Fantham, in that the macronucleus was posterior to (i.e. nearer to the non-flagellar end than) the micronucleus, and considering the similarity of conditions in N. E. Rhodesia, and the proximity of that country, it may be regarded as certain that the parasite is the same.

The parasite is further differentiated from *T. gambiense* by the numbers in which it may occur in the peripheral circulation. In the slide taken from Mr. R., from which the diagnosis was made, as many as 10 trypanosomes were counted in a single field (1 / 12 obj.), and of one of the Rhodesian cases, also an European, it is said, "Trypanosomes were present in considerable numbers up to 8-10 per field".

The numbers vary a great deal in natives, but in no case have they been found in such numbers as in these Europeans. Comparison is, however, difficult, as native cases are rarely seen in the early stages.

Incubation period. In only one native case has it been possible to obtain any information as to the date of infection, even approximately. In this instance the patient left a village on the Lakeshore to visit an infected locality, and was taken ill 3 weeks after her arrival, giving a maximum period of incubation of 21 days.

On the other hand there have been 3 infections of Europeans in whom the history was more definite. The first of these, Mr. R., was noticed to be unwell "quiet and not himself" 4 days after having been severely bitten by "tsetse"; 3 days later his temperature was found to be 102·5. Another case, infected in N. E. Rhodesia, had a "severe chill" — the initial symptom—, about a fortnight after having been bitten by the fly. In the third instance the initial fever seems to have developed some 7 days after the probable date of infection, though in the first mentioned case, the patient seemed to feel ill some 2-3 days earlier. It may be said, then, that the incubation period in Europeans is from 7-14 days; possibly it is rather longer in natives, but more evidence is required.

Duration. The total duration of the disease from infection to death is difficult to ascertain owing to the impossibility of getting reliable information from natives. At the outset, however, it was evident that the course of the disease was much more rapid than is usual in "sleeping sickness". In one instance a native left his home in the hills to visit a relative in an infected village, and was taken ill soon after his arrival. He was dead (of Trypanosomiasis) in less than 4 months. There was no evidence of any intercurrent disease. In this case the date of infection was ascertained by comparison with other events of known date. No treatment had been given.

On the other hand one case was under treatment at the camp for 9 months and died a month after its cessation. The history showed that she had been infected some 2-3 months before admission, giving a total duration of at least 12 months.

Three cases in which it is difficult to doubt the diagnosis have apparently recovered. One of these has now been under observation for 15 months, another for 13 months, and the third 7 months. The first two were under treatment for a time, the last has had none. The first case found in the Protectorate in 1908, also, is alive and has apparently recovered.

Symptoms.—(1) The initial fever.

Few details are available, save in the European cases. In each of these there was considerable local reaction caused by *G. morsitans*—presumably the infecting agent—in each instance in the sub-occipital region. In one case, Mr. R., it was described to me by a companion of the patient as a "lump about the size of a shilling," rather light in colour, and surrounded by a "dark purple ring". Pain at the site was complained of two days after he had been bitten by 'tsetse',—undoubtedly *G. morsitans*,—and the 'lump' was first noticed 4 days later. When seen, 14 days after the exposure to the fly, there was considerable oedema of the face and neck, but no trace of the 'lump' remained.

In the second instance, Dr. G., infected in N. E. Rhodesia, "a bite (by *morsitans*) received in the neck became greatly inflamed, and subsequently a black scab $\frac{3}{4}$ inch in diameter formed at this site."

The third patient, Mr. F., complained of pain in the neck and his native servants noticed 3 swellings on the side of his face, and one on back of the neck, apparently due to insect bites.

In natives history of a similar reaction was obtained in two instances, both cases of Dr. Prentice of the Kasungu Mission, but no similar history has been elicited from any of the natives infected in the Dowa District, though this has little significance.

It has been said that such local reaction to the bite of the fly may be due to bacterial agency. Only very transient swelling and irritation are, however, normally caused by the bite of *G. morsitans*, so that it is probable that the more severe reaction occurring in persons subsequently found to be infected is due to the introduction of the virus of Trypanosomiasis. The site of the inflammation, in all cases on the back of the neck, is explained by the fact that this is the usual

part attacked by the fly when the subject is clothed. Unclothed natives, on the other hand, are usually attacked on the back or shoulders, and any local reaction would be considered as an ordinary boil and so disregarded and forgotten.

The local symptoms above described are accompanied by a general malaise, probably associated with a rising temperature. The acute manifestations are heralded by a sharp attack of pyrexia, sometimes accompanied by rigor, and the usual concomitants—headache, pain in the back and limbs, and nausea. The patient is only semi-conscious and there may be delirium. Diarrhoea occurs in some cases, but in others there is obstinate constipation. The temperature at first shows only slight remissions, and ranges from 103 to 104.5. In one (untreated) case, Dr. G., the temperature became more irregular from the 5th day, and soon showed intermissions. Oedema of the feet and legs developed on the 20th day and considerable deep-seated pain was complained of, there was much pain on micturition, and twitchings of the fingers during sleep. Latterly some diminution of sensation in the extremities was complained of. Unfortunately the patient at this stage developed pneumonia, which proved fatal.

In the case of Mr. R. the temperature was 102.5 on the 7th day after infection and rose gradually during the following week, (to 104.2). The patient was seen on the 10th day after the onset of the pyrexia; he was then only semi-conscious; breathing stertorous. The neck was acutely inflamed, tender and indurated; glands not palpable. Tonsils and fauces swollen and inflamed, and covered with sloughy mucus. Pulse 120, regular but feeble and of low tension. Temperature (a.m.) 102. Parasites very numerous (10 in one field). Atoxyl grs VI injected. During the day the temperature rose steadily, reaching 105 at 6 p.m. At midnight the patient was greatly distressed, and the temperature is said to have been over 108 in the axilla. Shortly afterwards profuse sweating set in and the temperature fell to normal. When seen the next day the patient was very weak but conscious. The temperature was 99. Parasites were still present in the peripheral blood but the numbers were greatly diminished. The injection of Atoxyl was repeated. The following day no parasites were found in two slides, and they remained absent for 5 days. Thereafter they reappeared and were constantly present, though in varying numbers throughout the course of the disease. On the 13th day the improvement was very marked, the patient being cheerful and all objective symptoms having cleared up.

The above notes made at the time by the writer, are reproduced as illustrating the severity of the infection, and the exceptionally sharp reaction to Atoxyl.

A history of recurring attacks of headache and pain in the back and limbs ("litsipa") is frequently obtained from native cases, and it is probable that the onset of the disease is characterized by an initial pyrexial attack of more or less severity in all cases. Many native patients mention oedema of the feet as the earliest symptom, and this was seen in one. Allusion has already been made to the occurrence of oedema in the European case, Dr. G., on the 20th day of the disease. It is a very constant symptom later, but it would seem that it not uncommonly recurs from time to time throughout the course of the disease.

(2) Following the initial fever there is a stage of periodical attacks of fever, which recur in some cases with marked regularity and a corresponding increase in the number of parasites has been observed, though no exact enumerative methods have been attempted. This recurring fever is associated with a certain amount of emaciation and weakness, but frequently the condition of the patient improves under treatment. Severe pain in the legs is an almost constant complaint, and often seems to cause the patient more distress than any other symptom; the pain is often said to be worse at night.

In the European case, Mr. R., the periodicity of the fever was very marked. At first there was a 3 days period of pyrexia followed by 4 days more or less complete intermission; later in the 3rd month the apyrexial period extended to 5 days and the 3 days' rise in temperature was less.

This stage may continue for some months under treatment; the patient is sometimes able to work, the appetite is good, and there are frequently no objective symptoms. Sooner or later, however, the patient begins to lose strength, emaciation rapidly increases and there is marked anaemia. The temperature becomes remittent and the periodicity is lost; later it is very irregular, though it does not range high—rarely above 101, in some cases it does not exceed 100. After a few days the patient becomes too weak to walk, and does not leave his bed; he loses interest in his surroundings and refuses any but the most easily swallowed food. Obstinate Diarrhoea frequently sets in and helps to undermine the patient's strength. After some 2-3 weeks the weakness and emaciation are extreme, the patient becomes unconscious and cannot be roused. Food is no longer taken. Occasionally there is muttering delirium. But more often the patient is completely comatose. In from 2 to 3 days the patient is dead. In some cases there is a rise of temperature (103) immediately before death, but there is never hyperpyrexia. In one such case the patient was working (voluntarily) up to within a month of death, and though somewhat thin he had no objective symptoms. Parasites were, however, always plentiful in the blood. In this case as in many others no trypanosomes could be found in the blood when the coma preceding death had set in.

In other cases, usually those who have been diagnosed early and have been under treatment for some months, the symptoms of the last stage are similar to the above, but the course is longer. Even in these there is an absence of the clinical picture of "sleeping sickness." Often, though apparently asleep, he is conscious of one's entrance into the hut and opens his eyes directly when spoken to, and looks at his interrogator when replying. His manner, however, is frequently dull and apathetic, and cerebration is slow. He will not fall asleep during one's visit. He will take his food normally except when prevented from doing so by weakness.

In such cases the emaciation becomes so extreme that it is impossible to prevent the formation of bed-sores. A few days before the end the lips become swollen and ulcerated; incontinence occasionally occurs, but is not common. The onset of coma is invariably of fatal significance and death ensues in from 2-3 days.

(3). Glands. The following classification for degree of enlargement is used as being sufficiently exact for practical purposes:—

- + — — = small shotty glands; unpuncturable.
- + — = not immediately evident, but puncturable.
- + = obviously enlarged and easily puncturable.

Of the 47 cases diagnosed, 12 died before admission and were not seen. In the other cases the Posterior Cervical glands were affected at some period during the time that they were under observation, as follows:—

Of 35 cases 4 or 11.4% had glands classed as +.					
7	„	20.0%	„	„	„ + —
10	„	28.5%	„	„	„ + —
14	„	40.0%	„	„ no palpable glands.	

Of the 4 cases having + glands, one was an European, and 3 were natives. In the first, Mr. R., the adenitis developed in the 5th week, both sides being simultaneously affected. The enlargement was transitory but recurred several times during the following 3 weeks. A month after the initial attack no trace of enlargement remained, and there was no further recurrence. In the second case the patient dated his illness from the commencement of pain in the neck 4 days before he was seen; in this case also the adenitis was bilateral. It was very transient and did not recur: subsequently only one gland, classed as + —, remained enlarged. The other two instances have occurred recently; in both cases several glands were enlarged.

In view of the transitory nature of the enlargement, it is evident that under different circumstances, at least one of these cases might have been classed as having + — enlargement, and another as having no palpable glands. Per contra, it is probable that at least some of the other cases would have been found to have + glands if they had been seen earlier. This symptom is however, usually noticed by natives, so that a history thereof should be obtainable. No history, either of pain in the neck or of a 'lump' has been elicited from patients or their relatives.

With regard to + — glands it will be seen that for every patient having this degree of enlargement, there were two who had no palpable glands. In healthy natives above the age of 6 years, 6.4% were found to have + — glands, without obvious cause. Since 3% of the population was found to be infected, 6.4% had + — glands, and 20% of those infected had similar enlargement, then only 93% of natives having + — glands were found to be infected.

It should be noted that no difference has been detected between the + — glands of infected persons, and those of healthy natives. The glands are usually single, freely moveable, and, though not hard, are firm and not of the typical consistency of these classed as +. A chain of such glands was noted in one patient.

It is of interest to note that one man who was found to have a + — gland in September, 1910, which was punctured, the blood also being examined, both with negative results, was found to be infected in September, 1911. He was a mission 'teacher' and had been working up to within 4 months of his death at the end of September. No other similar case has been met with, so that this was probably merely coincidence.

Enlargement of the Posterior Cervical glands was noted in 3 of the earlier cases, but I do not know how they were classified.

With regard to glands other than those of the posterior cervical group, no degree of enlargement greater than + — has been noted in any native without obvious cause. The inguinal glands are almost invariably enlarged in all natives.

(4) Skin.

A circinate erythema occurred in the 11th week in one case, Mr. R.; the back and chest were affected. The rash cleared up in 3 days and reappeared for a similar period some 2 weeks later. In one of the earlier cases a "papular rash" is recorded. A history of rash "like measles" was obtained in two of my cases. It was regarded by the patients as the initial symptom. With the exception of such conditions as Pityriasis versicolor, common in all natives, no rashes have been seen in native cases.

The skin becomes very coarse, dry and scaly in many patients, but this is also seen in other conditions, especially in old people.

Oedema of the extremities is invariably present at some time during the course of the disease. The feet and anterior tibial regions are most commonly affected, but it also occurs in the hand and less often, in the face. As already mentioned the oedema may occur soon after infection, and the degree, varies considerably from time to time in individual cases. As a late symptom it is nearly constant. Some patients complain of severe pain in the feet, especially at night, preceding the development of the oedema; they sometimes state that the pain is markedly less as soon as the feet swell.

(5). Nervous system.

Tremor of the tongue and hands occurs in all cases in the last stages. In one case coarse tremors of the limbs, almost amounting to clonic spasm, were observed.

Epileptiform seizure was seen in one case. The patient was one of the few diagnosed early, and showed no objective symptoms. He had been treated with Atoxyl grs vi, two days, with 12 days interval. No parasites were found after the commencement of treatment. Two months after admission, and 5 days after an injection of Atoxyl, the temperature, which had been normal throughout, was found to be 99·4 and the following day he had a "fit" resulting in paraplegia accompanied by a temperature of 101. The next day there was a second, slighter attack, epileptiform in character, during which he was unconscious for some 5 minutes in the evening the temperature was sub-normal. He was quiet during the night but died at dawn. The paraplegia persisted to the end. There was no family history of epilepsy.

Delirium, usually of a muttering type, occurs in some of the more rapid cases. In one case only did the patient become violent; the delirium was delusory. The patient died on the third day.

No ocular symptoms, unconnected with treatment, have been noted.

Otitis media occurred in 4 cases. Deafness resulted in two of these, and also was noticed in two other cases in the later stages.

Loss of power in the legs, (? multiple neuritis) is usual in the last stages, and seems to be the primary cause of the patient becoming bedridden. In one instance the onset was sudden and was accompanied by considerable febrile disturbance lasting two days.

(6). Circulatory System.

Mitral insufficiency has been noted in 6 cases out of 32 admitted to the camp, — 18·7%. In one, very advanced case, the heart was dilated and the rhythm irregular; in the others compensation was maintained.

(7) Respiratory Symptom.

Slight bronchitis has been observed in about a third of all cases, and pleurisy in two. These conditions are common among natives. A large proportion of advanced cases admitted gave a history of "chifua",— a term which includes any condition causing cough. I am not inclined to attach much importance to this.

I have not seen any of the fits of coughing with respiratory difficulty reported by Thiroux, as occurring in "sleeping sickness."

(8). Digestive System.

A form of dysentery has frequently attacked the patients in both the Mvera and the Ngani camps; it yielded readily to treatment in most cases but was the immediate cause of death in some old patients. It should be mentioned that a similar affection is very common among the natives, especially at certain times of the year.

The spleen has been found to be enlarged in a number of the patients. It is difficult to say what the significance of such enlargement may be.

No marked enlargement of the liver has been noted.

Treatment. (1). Dioxydiamidoarsenobenzol, ("Salvarsan").

This preparation has been tried in 5 cases; a single injection was given to each case, intramuscularly. One patient was given 4 grm, two, 5 grm, and two, 6 grm. A neutral suspension of the drug with NaHO in distilled water was used, half being injected into each buttock. Some difficulty was experienced owing to the needle becoming blocked, as the only one available had too fine a bore. Especially was this the case when the injection was interrupted from any cause,—such as movement of the patient. Very careful clearing of the bore of the needle was necessary after each injection.

Local pain, in some instances referred to the feet was complained of by all the subjects, but in no case did it seem severe. Some deep-seated brawny infiltration resulted at the site of injection in two cases, one of whom had 4 grm and the other 6 grm. There was no evidence of abscess.

Of these 5 cases, one died 14 days, and another 21 days after injection; all were dead within 2 months. Not one showed even temporary improvement. In two instances no parasites were found after injection, but they had always been scarce in one, and the patient was the first to succumb; in the other the disappearance was only temporary (5 days) and was possibly only coincidence.

It should be added that all these cases were advanced, and were considered as hopeless. Possibly the drug may be more successful in more favourable subjects.

(2). Atoxyl. The drug has not been tried in combination with others, except with Hyd. perchlor., but its use singly has been discontinued owing to the occurrence of amblyopia in several of the cases, when continued for any length of time. Attempts were made to obviate this by discontinuing the drug for a time and resuming after an interval. One case relapsed soon after the injections were stopped and died, further treatment being refused. Another complained of dimness of vision when a single dose, 6 grm, had been given after an interval of two months.

The methods of administration tried are as follows :—

- (1) Atoxyl. 4 grm or Soamin grs x every 13th and 14th days.
- (2) Same as (1) plus Hyd. perchlor. gr 1/3 on 7th day.
- (3) Atoxyl. 6 grm once a week.
- (4) Soamin grs xv every 14th day.

Of these methods, No (1) was the most successful in prolonging life ; two cases survived more than 10 months after admission, and one 8 months, but all three became partially blind. Two others showed temporary improvement, one of them at the expense of the sight.

There seems to be little to choose between the other methods tried. In many instances treatment had perforce to be discontinued owing to the dislike of the patients to the intramuscular injection.

(3) Soamin. This was not found to have any advantages over Atoxyl, with which it was interchanged in most cases. In the one case in which it was persisted in, alone, the eyes were not affected; 7 doses of 15 grains were given. The patient improved considerably for some two months, but relapsed and died. The parasites persisted throughout.

Reference to Table I will show that :—

In Class A there have been three apparent recoveries,—two of them without treatment, the diagnosis not having been confirmed,—and 2 deaths.

In Class B several patients have been benefited temporarily by treatment, but there was no lasting improvement in any, all relapsed and were dead within a year.

In Class C not one case was benefited in the slightest degree by any form of treatment.

Diagnosis. It will be seen from the symptoms above described that this form of Trypanosomiasis, broadly speaking differs from that transmitted by *G. palpalis* only in severity and rapidity of course, due to the virulence of the strain. It is, however, just these characteristics which make the diagnosis difficult. In individual cases repeated blood examinations, inoculation of susceptible animals etc may be employed but in dealing with large numbers of natives inhabiting an infected area these can only be used to confirm or disprove a tentative diagnosis from physical signs. The course of this disease is so rapid and the physical signs are so fleeting and irregular in the early stages, that as a rule there are no indications by means of which subjects may be chosen for the more exact methods of diagnosis until the emaciation and weakness of the last stages have developed.

The gland palpation method has been tried from time to time but no cases have been found by this means. In one instance a village was visited and all the inhabitants palpated for enlarged cervical glands. A month later two of them were found to be infected, one being classified as B, and the other C. There was no doubt that both had been seen on the first visit.

It was hoped that auto-agglutination would be of use as a means of diagnosis, but though the blood shows this phenomenon in the majority of infected persons, it varies considerably in degree, and has been altogether absent in one or two cases. On the other hand it has been observed in persons in whom repeated examinations have failed to find trypanosomes, and who have subsequently shown no signs of illness.

Marked leucocytosis occurs in most cases, the large mononuclear elements being chiefly affected, but as a rule it is not in any way marked till death is imminent.

Morbid Anatomy. One of the earlier cases (No. 9) died in Zomba and a post mortem examination was made by Dr. Stannus, but revealed little. No autopsy has been performed at the Camp in deference to native superstitions, as it was feared to make segregation even more dreaded.

TABLE (1).

TREATMENT.

No. of Case.	Date of Admn.	Stage of Disease.	Method of Treatment.	Date of Death.	Remarks.
11	8-8-10	C	nil.	14-9-10	
12	31-8-10	B	(See note)	5-6-11	Returned to S. Africa. Jan 1911.
13	5-9-10	C	nil.	8-9-10	
14	10-9-10	C	1	28-10-10	No improvement.
16	13-10-10	C	nil.	13-10-10	
18	16-10-10	A	1	—	No symptoms after 2½ mos tmt. Tmt contd 6 mos. No relapse.
19	16-10-10	C	1	28-10-10	No improvement.
20	13-10-10	B	1 (6 mos)	8-8-11	Amblyopia. Salvarsan given 25-7-11.
21	15-11-10	B	2, 3.	1-4-11	Temp. improvemt, for 3 mon.
23	3-12-10	B	(1, 5mos)	29-7-11	Partiall. blind.
24	23-12-10	B	1 (5 mos)	8-10-11	6 grm caused part, blindness after 2 mos' interval.
25	8-1-11	A	1	8-3-11	Epileptiform attk, paraplegia.
27	7-3-11	C	1	30-3-11	No improvement.
31	9-3-11	B	1,3	19 6-11	Partially blind.

TABLE (1).—(*Continued.*)

TREATMENT.

No. of Case.	Date of Admn.	Stage if Disease.	Method of Treatment.	Date of Death.	Remarks.
32	9-3-11	B	1	2-4-11	Dysentery.
34	14-3-11	C	1	8-4-11	No improvement, Dysentery.
35	10-3-11	C	nil.	14-3-11	
36	17-3-11	C	nil.	19-3-11	
37	23-3-11	B	(3 (2 mos), 4) ((2 mos), 5) (1(3mos (int,) 4 mos., 4 ,, "Maningo" (1 mo)	12-9-11	Great improvemt lasting 4½ mon, relapse.
38	29-3-11	B	4 mos., 4 ,, "Maningo" (1 mo)	17-11-11	Apparent recovery 4 mos.
39	4-4-11	B	Do, 2, 5.	27-6-11	Tryps, ret, relapse.
40	1-4-11	B	nil.	1-10-11	Rapid case.
44	8-5-11	A	nil.	—	No imp, at first. Imp c 2 relapse.
46	25-5-11	A	nil.	—	Diag, unconfirmed.
49	28-5-11	B	4	30-10-11	Ditto.
51	28-6-11	C	nil.	16-8-11	Temp, improvemt, relapse.
52	9-7-11	C	5	20-8-11	Dysentery.
53	18-7-11	C	nil.	20-7-11	No improvement.
57	13-10-11	C	nil.	6-11-11	
58	5-12-11	B	nil.	15-1-11	
60	9-12-11	C	nil.	14-12-11	
61	16-12-11	C	nil.	13-1-12	
62	28-12-11	C	nil.		

Note : A = 'cas en bon etat'; B = clinical signs present ; C = advanced cases.
 Methods of Treatment ;— 1. Atoxyl 4 grm or Soamin grs X every 13th and 14th day.
 2. Same as 1, plus Hyd, perchlor gr 1-3 on 7th day.
 3. Atoxyl. 6 grm once a week, (or Soamin grs X).
 4. Soamin grs XV every 14th day.
 5. Salvarsan.

Case No. 12. First 5 weeks, Atoxyl grs 5, 2 successive days, 5 days interval. Second 5 weeks, Atoxyl grs 3, every 3rd and 4th day. 11th to 18th week, soamin grs X every 13th and 14th day, Hg on 7th days. 18th week to discharge, soamin grs x, 2 successive days, interval of 5 days.
 Case No. 22, though under treatment for a short time, is not included in the above table, as there is some doubt as to the diagnosis.

MEREDITH SANDERSON,
Medical Officer.

NOTE ON A CASE OF QUININE IDIOSYNCRASY.

Mrs. ——— Admitted to Hospital on 9th April, 1912. Disease, malaria. Temp. on admission 101.5, parasites found in blood. Had a previous attack about 14 days ago, and had been treated with medicinal methylene blue, gr. 2 to dose. This had a decided effect in reducing her temperature, but I decided to try once more the effect of Quinine, this being the first time I had seen the case.

On 10-4-12 gr. 5 of Euquinine were given by the mouth (to avoid any question of "imagination" the patient was not told that she was taking Quinine). Within five minutes of taking this dose severe vomiting set in, with collapse, feeble pulse, urticaria, and a peculiar sensation of numbness about the nose and eyes. The vomiting lasted, with intermissions, for nearly five hours. It was rather strange that no tinnitus was complained of. After this I, not unnaturally, discontinued Quinine by the mouth. I thought it however worth while trying the effect of rectal administration.

On 12-4-12, I gave her gr. 3 Quin. Bihyd. c. min. 5. Tr. Opii. per rect. the bowels acted about 20 minutes after, but she had no unpleasant symptoms from the Quinine. Encouraged by this, on 15-4-12 (a menstrual period having intervened) I gave her gr. 3 Quin. Hyd. c. Tr. Opii. p. r. as before, at 9 a.m. no ill effects. At 2 p. m. I gave her gr. 5 Quin. Hyd. c. Tr. Opii. per rect. and in a few minutes all the original symptoms recurred, in a somewhat milder degree, but sufficiently distressing. After that I decided to return to methylene Blue treatment, which at any rate did not produce any ill effects. The conclusion is that this patient is unable to take more than three grains of Quinine in one dose, which would not be of much value in a severe attack of malaria.

I believe it is claimed for Euquinine that it does not produce any unpleasant or toxic symptoms.

A. G. ELDRED.

M. O. Blantyre.

ANKYLOSTOMIASIS IN THE NORTH NYASA DISTRICT.

Case 1. Native. 21-2-12.

Male adult, aged about 45, residence, Vua.

Symptoms. Eczematous rash on feet and ankles, both ankles slightly swollen and œdematous, said he had noticed this for "a long time." Complained of rheumatic pains in ankle joints. No other signs or symptoms, H. S. normal, no wasting.

Stool examination. Ankylostome ova found, scanty, 2 or 3 to slide, one Embryo, stool 30 hours old.

Case 2. Native 29-2-12.

Female adult, aged about 30, residence, Karonga.

Symptoms. Complained of palpitation, commencing 14 days previously. On examination, heart impulse very evident, loud mitral murmur at apex, rapid pulse. No wasting, no ground-itch or other symptoms.

Stool examination. Ankylostome ova found, 5 or 6 to slide, one Embryo, stool 20 hours old, also Ascaris ova, and Infusoria resembling Balantidium coli.

Case 3. European. 3-3-12.

Male adult, aged 37, had been in Karonga for some months. Six weeks previously had quotidian fever, commencing about midnight and with profuse sweating, was normal during the day. This lasted a week; he was in good health otherwise, all internal organs healthy.

Blood examination shewed nothing except slight malarial infection, no Eosinophilia; was a regular Quinine taker. Under treatment this condition improved. A week ago, he complained of a rash on feet and ankles, it caused a lot of irritation; rash was of an eczematous type, he stated that about a year ago he had suffered from a somewhat similar rash. Was otherwise in good health.

Stool examination. Ankylostome ova found, very scanty, 1 to slide. After treatment with Beta Naphthol, ova still very scanty, only one to slide in 3 or 4 slides examined, the parent worm was not found, though careful search was made.

Case 4. Native. 6/3/12. Female adult, aged about 49, residence Karonga.

Symptoms. Fainting attacks, duration indefinite. On examination, Apical murmur, Systolic, Impulse bounding pulse, rapid. Ground-itch indefinite, wasted and apparently anaemic.

Stool examination. Ankylostome ova found in great abundance, 16 or 20 to slide. Also Ascaris ova, and one lateral spined Billharzia ovum.

A.G. ELDRED,

Medical Officer.